REPORT OF
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS, INC.
IN GRAND PRAIRIE, TEXAS
ON MAY 22, 2018

Submitted to:

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P. O. Box 13087
Austin, Texas 78711-3087

Submitted by:

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Permit Number 51907

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Prepared on:

May 31, 2018

ECSi

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TEST DATE

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1.0 INTRODUCTION

On Tuesday, May 22, 2018, ECSi performed air pollution source testing of an ethylene oxide (EtO) emission-control system operated by Sterigenics, Inc. in Grand Prairie, Texas. The control system tested was a Maxon Catalytic Oxidizer, which is used to control emissions from five commercial EtO sterilizer backvents, and one aeration room. The purpose of the testing program was to evaluate continued compliance with the conditions established in the Air Quality Permit granted to Sterigenics, Inc. by the Texas Commission on Environmental Quality (TCEQ).

2.0 EQUIPMENT

The gas-sterilization system is comprised of five commercial sterilizers, all discharging through liquid-ring vacuum pumps to an Advanced Air Technologies packed-tower acid scrubber emission control device. One aeration room and five sterilization chamber backvents are all discharged to a Maxon catalytic oxidizer emission-control device. The gas-sterilization and emission-control equipment currently consists of the following:

- Three Vacudyne commercial ethylene oxide gas sterilizers, each comprised of a steam-heated sterilization chamber (30 pallet capacity), and a Dekker 3-pump oil-sealed liquid ring recirculating vacuum pump skid (two 50 hp liquid ring pumps, plus one 25 hp booster pump);

- Two Trumbo commercial ethylene oxide gas sterilizers, each comprised of a steam-heated sterilization chamber (30 pallet capacity), and a Dekker 3-pump oil-sealed liquid ring recirculating vacuum pump skid (one 50 hp liquid ring pump, plus one 25 hp booster pump);

- One 12,200 square foot aeration room, comprised of a heated aeration chamber and an exhaust system.

Sterilizer vacuum pump emissions are controlled by:

- One Advanced Air Technologies Safe Cell I emission-control system, comprised of a packed-tower chemical scrubber, equipped with a packed reaction/interface column, a scrubber fluid recirculation system (2 recirculation pumps - 1 primary and 1 backup - each @ 350 gpm and 15 hp), and two scrubber fluid reaction/storage tanks.

Aeration and backvent emissions are controlled by:

- One Maxon catalytic oxidizer, 15,000 SCFM, equipped with a prefilter, a gas-fired heater, a reactive catalyst bed, and an exhaust blower.

3.0 TESTING

EtO source testing was conducted in accordance with the procedures outlined in CARB Method 431, the USEPA approved alternate method to the procedures listed in 40 CFR, Part 63.365, subpart O. EtO concentration measurement for each test run was conducted simultaneously at the inlet and outlet of the catalytic oxidizer during chamber backvent, and during a one-hour interval of the 24-hour aeration process. A total of three chamber backvent test runs, and three one-hour aeration test runs, were performed.

During backvent and aeration testing, EtO concentration at the inlet and the outlet of the catalytic oxidizer was determined using direct source sample injection into the gas chromatograph (GC). All backvent and aeration testing was performed using freshly sterilized product. The testing program was conducted in accordance with the procedures outlined in the following sections.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at Sterigenics, Inc. was tested to evaluate compliance with the requirements specified in the TCEQ Permit. The current testing was performed to demonstrate continued compliance with the following requirement:

- Aeration and backvent emissions must be discharged to control equipment which achieves an EtO emission-reduction efficiency of at least 99.0%, or an outlet EtO concentration of no greater than 1 ppmv.

Testing is required to demonstrate compliance with these requirements. Source testing of the emission-control device is required initially, and may be required periodically thereafter.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

EtO source testing was conducted in accordance with the procedures outlined in CARB Method 431, the USEPA approved alternate method to the procedures listed in 40 CFR, Part 63.365, subpart O. EtO concentration measurement for each test run was conducted simultaneously at the inlet and outlet of the catalytic oxidizer during chamber backvent, and during a one-hour interval of the 24-hour aeration process. A total of three chamber backvent test runs, and three one-hour aeration test runs, were performed.

During backvent and aeration testing, EtO concentration at the inlet and the outlet of the catalytic oxidizer were determined using direct source sample injection into the gas chromatograph (GC). All backvent and aeration testing was performed using freshly sterilized product.

Operation and documentation of process conditions was performed by personnel from Sterigenics, Inc. using existing monitoring instruments installed by the manufacturer of the equipment to be tested. In accordance with TCEQ requirements, and the procedures established in USEPA 40 CFR, Part 63.365, Subpart O, the following parameter was recorded: operating temperature at the catalyst bed outlet, using the thermocouple associated with catalyst bed #1, which is located closest to the oxidizer outlet.

5.2 CONTROL EFFICIENCY MEASUREMENT

During backvent and aeration testing, EtO concentration at the inlet and outlet of the catalytic oxidizer were determined using direct source sample injection into the GC. Since the source gas flow is identical at the inlet and outlet of the catalytic oxidizer control-efficiency of EtO during aeration and backvent was calculated by comparing the concentration of EtO vented to the system inlet to the concentration of EtO vented from the system outlet.

CARB Method 431, Appendix A, specifies that catalytic oxidizer emission-control devices may be tested, and control efficiency determined, without volumetric flow measurement as long as the following criteria are met:

1) There is no dilution between the inlet and outlet sampling locations
2) There is identical flow at the inlet and outlet sampling locations, and
3) There is constant flow throughout the duration of the compliance test.

These conditions were all met during the testing performed at Sterigenics. Specifically, condition 2 was met due to the extremely high flow rate of ambient air being drawn through the oxidizer (15,000CFM) which, when compared to the relatively low flow rate of natural gas to the heater burner, renders the potential contribution of any fuel gas combustion products to the outlet flow rate to be extremely negligible. In addition, emissions testing for combustion products performed on similar gas-fired catalytic oxidizers used to control EtO emissions has demonstrated that the exhaust gas composition at the outlet of the oxidizer contains moisture, oxygen, carbon dioxide, and carbon monoxide at ambient levels, and that any deviations are at low ppmv levels. This is further proof that the potential contribution of any fuel gas combustion products to the outlet flow rate is insignificant.

During the backvent and aeration phases, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) was used to quantify inlet EtO concentration, and a photoionization detector (PID) was used to quantify low-level EtO concentration at the emission-control device outlet.

5.3 SAMPLE TRANSPORT

Source gas was pumped to the GC at approximately 1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the inlet, the sampling port was located in the common backvent/aeration discharge duct, upstream of the oxidizer. At the outlet of the catalytic oxidizer, sampling ports were located in the exhaust stack downstream of the catalyst bed.

5.4 GC INJECTION

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately five minute intervals during the aeration-phase testing. Helium was the carrier gas for both the FID and PID.

5.5 GC CONDITIONS

The packed columns for the GC were both operated at 80 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B. During the analysis, the FID was operated at 250 degrees C. The support gases for the FID were helium (99.999% pure), hydrogen (99.995% pure) and air (99.9999% pure). Any unused sample gas was vented from the GC system back to the inlet of the control device being tested.

5.6 CALIBRATION STANDARDS

The FID was calibrated for mid-range part-per-million-by-volume (ppmv) level analysis using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

The PID was calibrated for low-range ppmv level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix I.

5.7 SAMPLING DURATION

Backvent testing was performed in conjunction with normal production operations, during the chamber exhaust venting which is conducted for each sterilization chamber upon conclusion of the sterilization cycle, immediately prior to and during chamber unloading. Backvent sampling duration was 15 minutes for each of the three test runs.

Since aeration is a 24-hour process at this facility, with constant discharge flow from the aeration chambers to the emission-control system, aeration testing consisted of three 1-hour test runs. Each test run was performed with freshly sterilized product in the aeration chambers.

5.8 CONTROL-EFFICIENCY CALCULATIONS

Control efficiency of EtO was calculated for aeration and backvent, using the following CARB-approved equation:

Efficiency = $(C_i - C_o / C_i)(100)$

Which is a mathematical simplification of the following equation from CARB Method 431, with the identical inlet/outlet flow value removed:

Efficiency = $(W_i - W_o / W_i)(100)$

Where:

W_i = Mass flow rate to the control device inlet, pounds, calculated as $(C_i)(F_i)$

Where:

C_i = EtO concentration at the control device inlet

F_i = Flow rate at the control device inlet

W_o = Mass flow rate from the control device outlet, pounds, calculated as $(C_o)(F_o)$

Where:

C_o = EtO concentration at the control device outlet

F_o = Flow rate at the control device outlet

Results of the control-efficiency testing are presented in Section 8.0, and in Tables 1 and 2.

6.0 TEST SCENARIO

The backvent and aeration testing was performed during normal process load conditions. Three backvent and three aeration test runs were conducted in series to verify the performance of the emission-control device. The testing schedule was as follows:

1) Testing equipment was set up and calibrated.
2) Backvent Phase Test Run #1 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
3) Aeration Phase Test Run #1 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
4) Aeration Phase Test Run #2 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
5) Backvent Phase Test Run #2 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
6) Aeration Phase Test Run #3 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
7) Backvent Phase Test Run #3 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
8) Post calibration check was performed, testing equipment was packed.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device which produces carbon dioxide and water vapor. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix I.

8.0 TEST RESULTS

The catalytic oxidizer was found to have an average EtO control efficiency of 99.98 percent for backvent, and an average EtO control efficiency of 99.98 percent for aeration. In accordance with state and federal requirements, backvent and aeration discharge streams must be vented to control equipment with an EtO emission-reduction efficiency of at least 99 percent. The catalytic oxidizer met this requirement.

The test results are summarized in Tables 1 and 2. These tables include results for EtO control efficiency of the emission-control device. Chromatograms and chromatographic supporting data are attached as Appendices A through G. Copies of field data and calculation worksheets are attached as Appendix H.

TABLES

TABLE 1
ETHYLENE OXIDE CONTROL EFFICIENCY - BACKVENT
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE
OPERATED BY STERIGENICS, INC.
IN GRAND PRAIRIE, TEXAS
ON MAY 22, 2018

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	849	51.1	0.01	99.9804
1	850	49.7	0.01	99.9799
1	852	124	0.01	99.9919
1	853	65.0	0.01	99.9846
1	854	57.5	0.01	99.9826
1	855	54.6	0.01	99.9817
1	856	53.7	0.01	99.9814
1	858	49.5	0.01	99.9798
1	859	49.7	0.01	99.9799
1	900	49.7	0.01	99.9799
1	901	48.4	0.01	99.9793
1	903	49.4	0.01	99.9798
2(4)	911	52.9	0.01	99.9811
2	912	115	0.01	99.9913
2	913	80.2	0.01	99.9875
2	915	61.6	0.01	99.9838
2	916	57.1	0.01	99.9825
2	917	57.1	0.01	99.9825
2	918	54.8	0.01	99.9818
2	920	56.4	0.01	99.9823
2	921	55.9	0.01	99.9821
2	923	56.9	0.01	99.9824
2	924	58.5	0.01	99.9829
2	925	58.1	0.01	99.9828
3(5)	1407	62.8	0.01	99.9841
3	1408	64.6	0.01	99.9845
3	1409	60.6	0.01	99.9835
3	1410	60.2	0.01	99.9834
3	1411	52.4	0.01	99.9809
3	1413	52.8	0.01	99.9811
3	1414	53.1	0.01	99.9812
3	1415	53.6	0.01	99.9813
3	1416	58.2	0.01	99.9828
3	1418	57.6	0.01	99.9826
3	1419	56.9	0.01	99.9824
3	1420	57.7	0.01	99.9827
TIME-WEIGHTED AVERAGE:		**59.93**	**0.0100**	**99.9826**
			TCEQ REQUIRED CONTROL EFFICIENCY:	**99%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Backvent Phase Test Run #1 started at 8:49, ended at 9:04.
(4) - Backvent Phase Test Run #2 started at 9:10, ended at 9:25.
(5) - Backvent Phase Test Run #3 started at 14:06, ended at 14:21.
(6) - During backvent testing, the average recorded catalyst bed temperature was 345 deg F

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TABLE 2
ETHYLENE OXIDE CONTROL EFFICIENCY - AERATION
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE
OPERATED BY STERIGENICS, INC.
IN GRAND PRAIRIE, TEXAS
ON MAY 22, 2018

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	927	53.1	0.01	99.9812
1	932	52.1	0.01	99.9808
1	937	53.3	0.01	99.9812
1	942	55.1	0.01	99.9819
1	947	58.0	0.01	99.9828
1	952	68.1	0.01	99.9853
1	957	68.7	0.01	99.9854
1	1002	65.1	0.01	99.9846
1	1007	65.0	0.01	99.9846
1	1012	66.4	0.01	99.9849
1	1017	63.2	0.01	99.9842
1	1022	66.5	0.01	99.9850
2(4)	1027	50.0	0.01	99.9800
2	1032	50.1	0.01	99.9800
2	1037	48.3	0.01	99.9793
2	1042	57.8	0.01	99.9827
2	1047	57.7	0.01	99.9827
2	1052	52.8	0.01	99.9811
2	1057	53.4	0.01	99.9813
2	1102	51.1	0.01	99.9804
2	1107	64.2	0.01	99.9844
2	1112	63.9	0.01	99.9844
2	1117	69.6	0.01	99.9856
2	1122	66.8	0.01	99.9850
3(5)	1127	61.0	0.01	99.9836
3	1132	56.3	0.01	99.9822
3	1137	56.3	0.01	99.9822
3	1142	63.6	0.01	99.9843
3	1147	63.4	0.01	99.9842
3	1152	61.8	0.01	99.9838
3	1157	62.7	0.01	99.9841
3	1202	61.4	0.01	99.9837
3	1207	59.9	0.01	99.9833
3	1212	58.7	0.01	99.9830
3	1217	56.7	0.01	99.9824
3	1222	53.7	0.01	99.9814
TIME-WEIGHTED AVERAGE:		**59.33**	**0.0100**	**99.9830**
			TCEQ REQUIRED CONTROL EFFICIENCY:	**99%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Phase Test Run #1 started at 9:25, ended at 10:25.
(4) - Aeration Phase Test Run #2 started at 10:25, ended at 11:25.
(5) - Aeration Phase Test Run #3 started at 11:25, ended at 12:25.
(6) - During aeration testing, the average recorded catalyst bed temperature was 345 deg F

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APPENDICES

APPENDIX A

Calibration Data

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EtO Calibrations

Site: STERIGENICS - GRAND PRAIRIE, TX

Date: 5/22/2018

INLET - FID

ppm	0	1.10	10.1	100	1,000	10,080		AUDIT
Area 1	0	0.407	3.81	37.1				48.8
Area 2	0	0.409	3.74	37.2				READS
Area 3	0	0.410	3.78	37.4				49.8
AVG.	0	0.409	3.78	37.2	#DIV/0!	#DIV/0!	Dev.	2.0%

OUTLET - PID

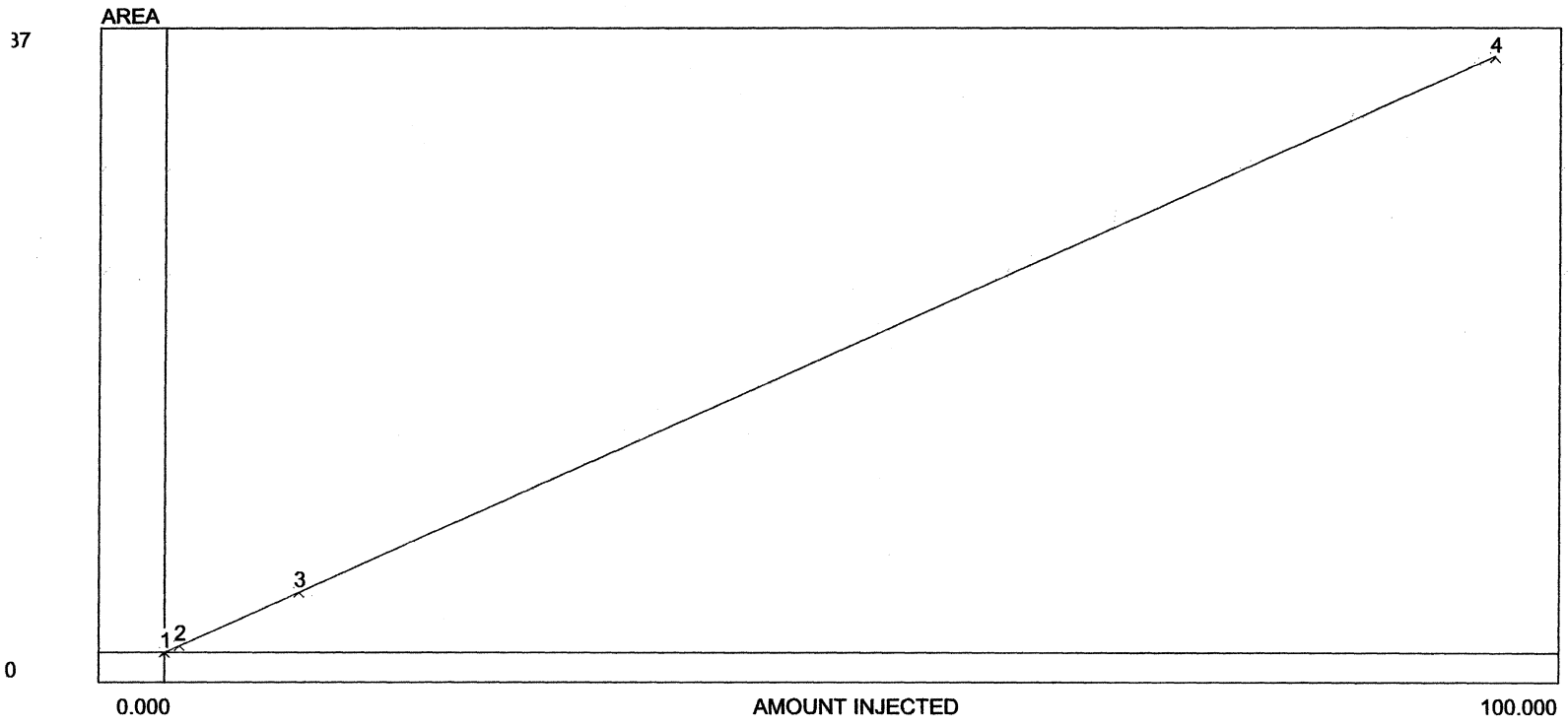
ppm	0	1.10	10.1	100		AUDIT
Area 1	0	1.89	16.6	162		48.8
Area 2	0	1.87	17.1	164		READS
Area 3	0	1.90	16.7	164		48.6
AVG.	0	1.89	16.8	163	Dev.	-0.4%

LOD Calculation EtO							
STERIGENICS - GRAND PRAIRIE, TX							
5/22/2018							
			Y =	A	+	m	x
Outlet			ppm =	7.95E-04	+	0.61296	x area
Lowest Cal Gas				R2	=	1.00000	
				Corr. Coeff.	=	1.00000	
	Area	**Calc ppm**		LOD	=	|A| + 3s	
	1.890	1.159	ppm	LOD	=	0.029	ppm
	1.870	1.147	ppm				
	1.900	1.165	ppm				
AVG		**1.157**	ppm				
Std Dev, s		**0.009**	ppm				
				1/2 LOD	=	**0.014**	**ppm**

Component file: eto1-100.cpt

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.300		0.000	
2	Ambient H2O	0.300	0.450		0.000	
3	Ethylene Oxide	0.450	0.550	C:\peak359\1Ster	0.00018	ppm
4	Acetaldehyde	0.550	0.800		0.000	
5	CO2	0.800	1.000		0.000	

Calibration file: C:\peak359\1SterGP2018.cal



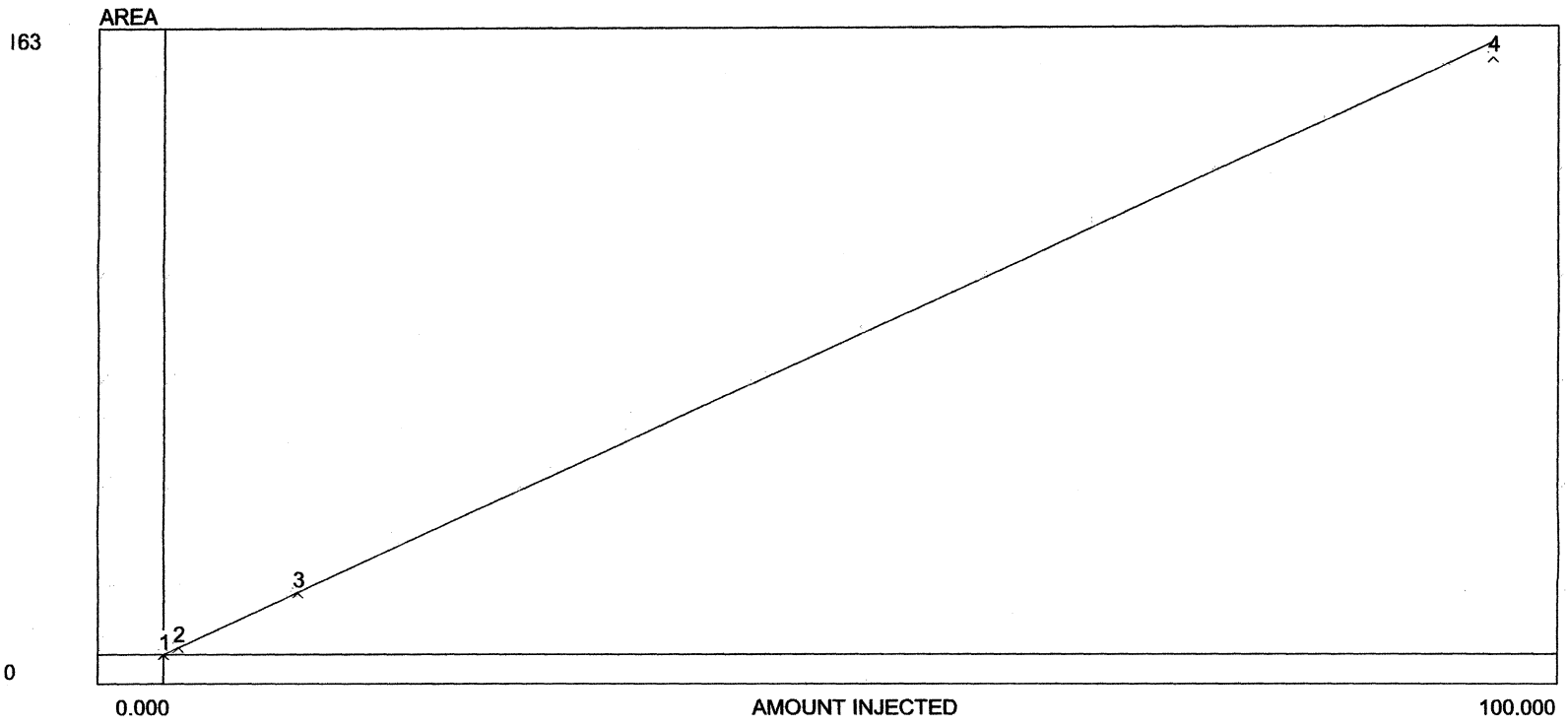
Avg slope of curve: 0.37
Y-axis intercept: 0.00
Linearity: 1.00
Number of levels: 4
SD/rel SD of CF's: 0.2/66.7
Y=0.3727X
r2: 1.0000
Last calibrated: Tue May 22 08:10:10 2018

Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	0.409	1.100	0.372	0.409	N/A	N/A
3	3.780	10.100	0.374	3.780	N/A	N/A
4	37.200	100.000	0.372	37.200	N/A	N/A

Component file: eto2-100.cpt

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.300		0.000	
2	Ambient H2O	0.300	0.450		0.000	
3	Ethylene Oxide	0.450	0.550	C:\peak359\2Ster	0.00018	ppm
4	Acetaldehyde	0.550	0.800		0.000	
5	CO2	0.800	1.000		0.000	

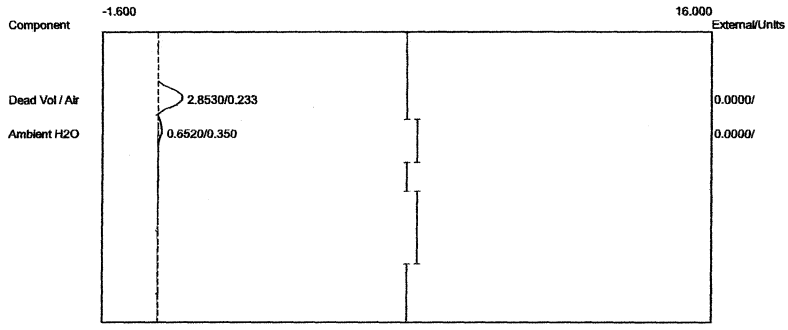
Calibration file: C:\peak359\2SterGP2018.cal



Avg slope of curve: 1.67
Y-axis intercept: 0.00
Linearity: 1.00
Number of levels: 4
SD/rel SD of CF's: 0.8/66.7
Y=1.6705X
r2: 1.0000
Last calibrated: Tue May 22 08:09:33 2018

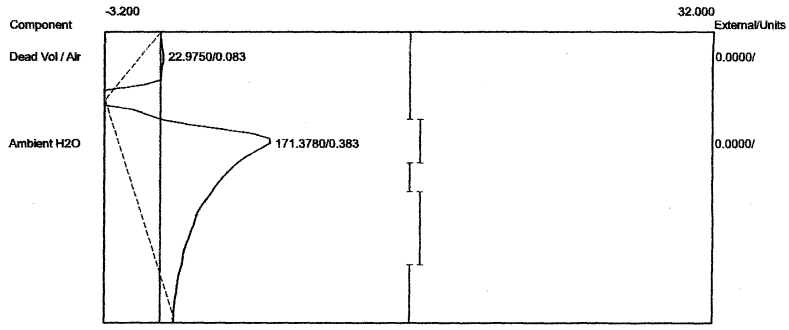
Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	1.890	1.100	1.718	1.890	N/A	N/A
3	16.800	10.100	1.663	16.800	N/A	N/A
4	163.000	100.000	1.630	163.000	N/A	N/A

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:33:12
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



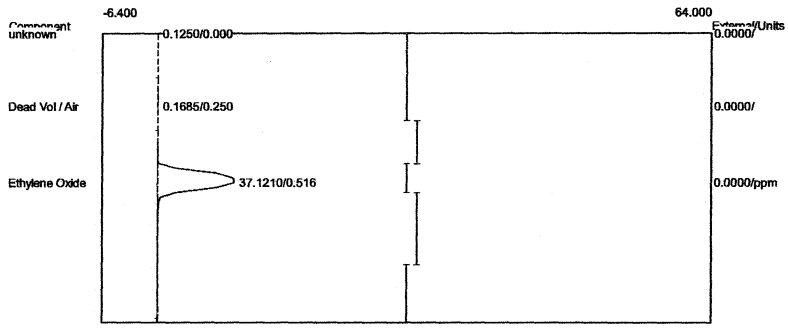
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.8530	0.0000	
Ambient H2O	0.350	0.6520	0.0000	
		3.5050	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:33:12
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



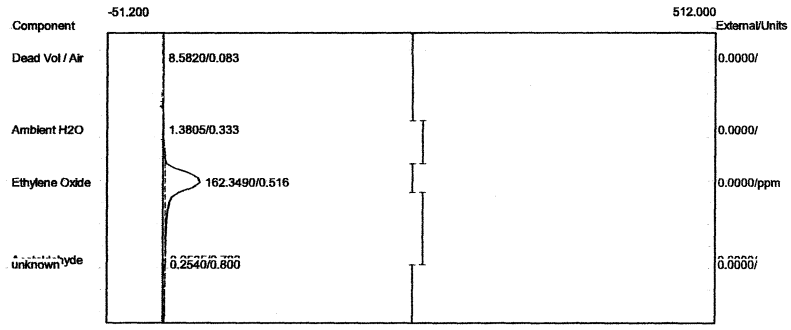
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	22.9750	0.0000	
Ambient H2O	0.383	171.3780	0.0000	
		194.3530	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:36:31
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-C01.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



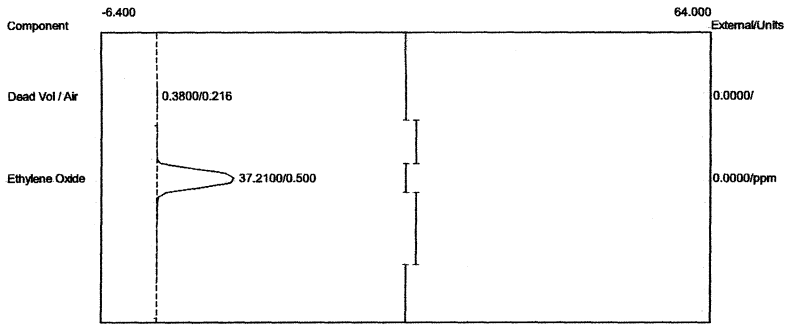
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	0.1685	0.0000	
Ethylene Oxide	0.516	37.1210	0.0000	ppm
		37.2895	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:36:31
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-C01.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



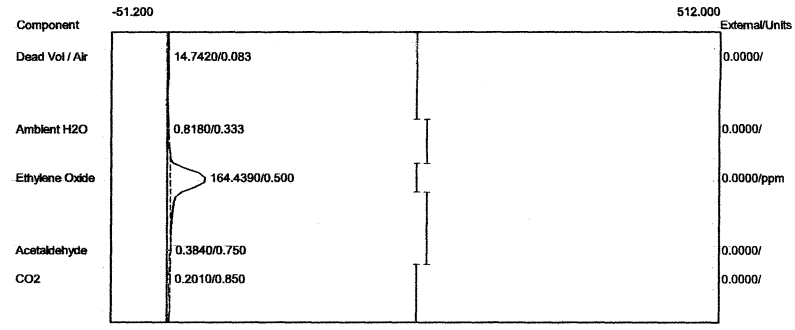
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	8.5820	0.0000	
Ambient H2O	0.333	1.3805	0.0000	
Ethylene Oxide	0.516	162.3490	0.0000	ppm
Acetaldehyde	0.783	0.0535	0.0000	
		172.3650	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:40:40
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-C02.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



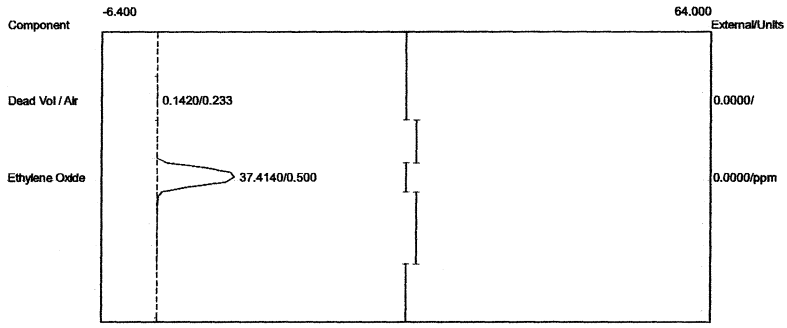
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	0.3800	0.0000	
Ethylene Oxide	0.500	37.2100	0.0000	ppm
		37.5900	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:40:40
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-C02.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



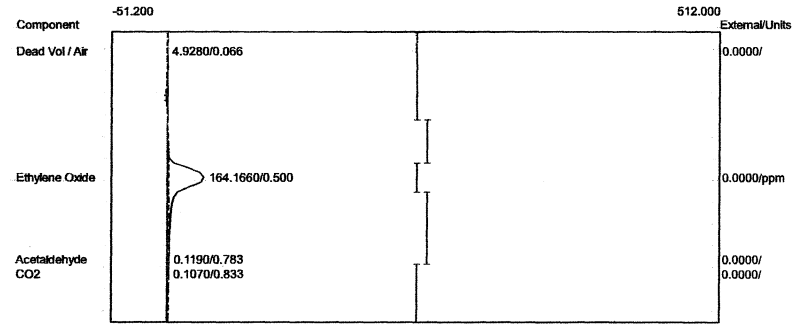
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	14.7420	0.0000	
Ambient H2O	0.333	0.8180	0.0000	
Ethylene Oxide	0.500	164.4390	0.0000	ppm
Acetaldehyde	0.750	0.3840	0.0000	
CO2	0.850	0.2010	0.0000	
		180.5840	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:44:39
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-C03.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



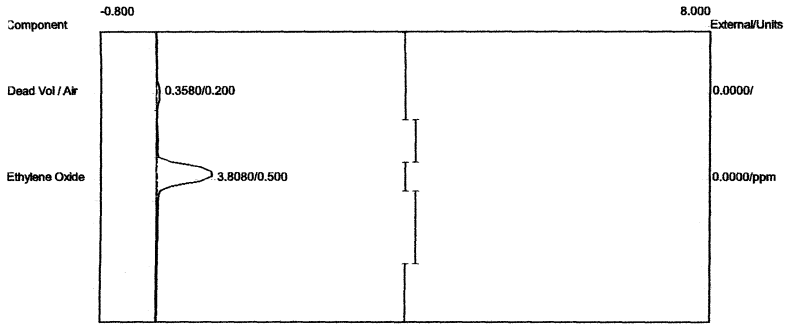
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	0.1420	0.0000	
Ethylene Oxide	0.500	37.4140	0.0000	ppm
		37.5560	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:44:39
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-C03.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



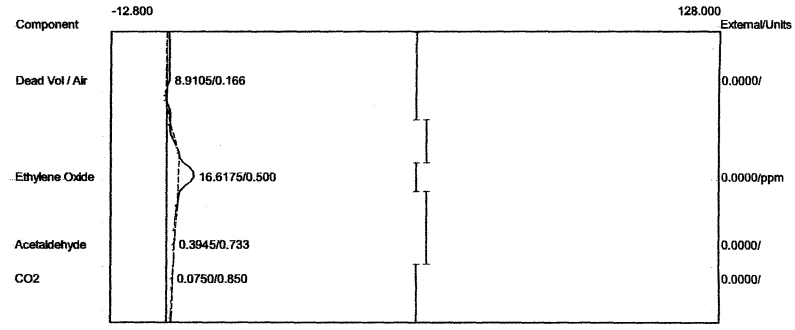
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	4.9280	0.0000	
Ethylene Oxide	0.500	164.1660	0.0000	ppm
Acetaldehyde	0.783	0.1190	0.0000	
CO2	0.833	0.1070	0.0000	
		169.3200	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:47:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-C04.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



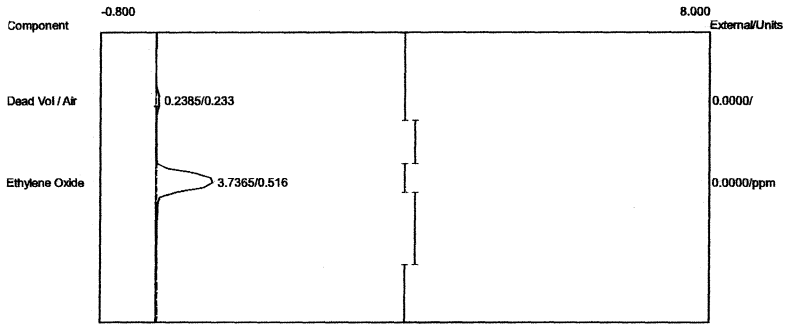
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	0.3580	0.0000	
Ethylene Oxide	0.500	3.8080	0.0000	ppm
		4.1660	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:47:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-C04.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



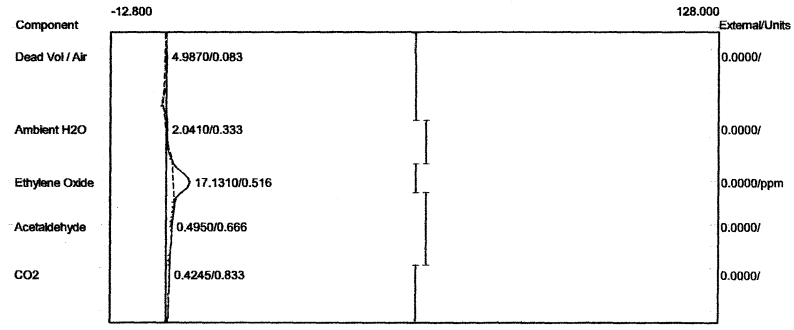
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	8.9105	0.0000	
Ethylene Oxide	0.500	16.6175	0.0000	ppm
Acetaldehyde	0.733	0.3945	0.0000	
CO2	0.850	0.0750	0.0000	
		25.9975	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:51:18
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-C05.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



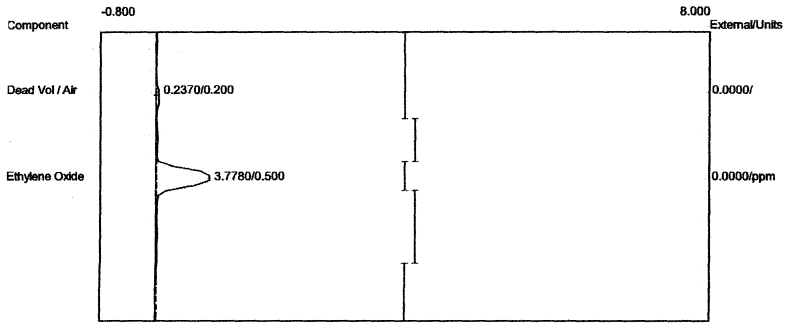
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	0.2385	0.0000	
Ethylene Oxide	0.516	3.7365	0.0000	ppm
		3.9750	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:51:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-C05.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



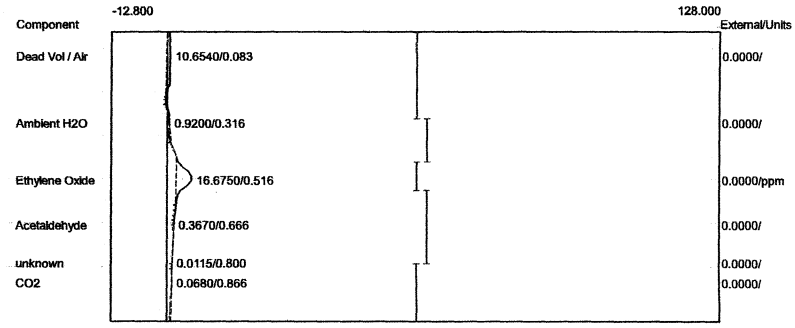
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	4.9870	0.0000	
Ambient H2O	0.333	2.0410	0.0000	
Ethylene Oxide	0.516	17.1310	0.0000	ppm
Acetaldehyde	0.666	0.4950	0.0000	
CO2	0.833	0.4245	0.0000	
		25.0785	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:55:38
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-C06.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



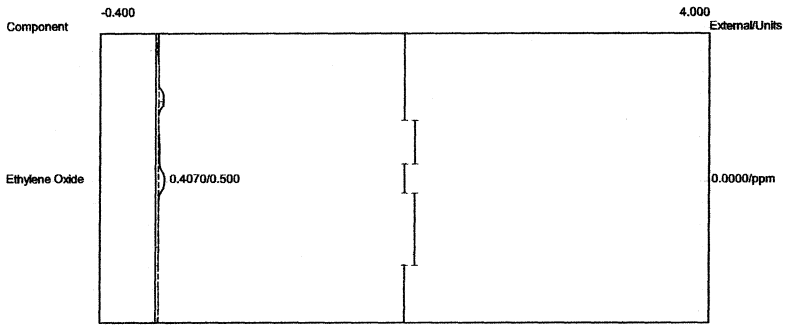
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	0.2370	0.0000	
Ethylene Oxide	0.500	3.7780	0.0000	ppm
		4.0150	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 07:55:38
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-C06.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



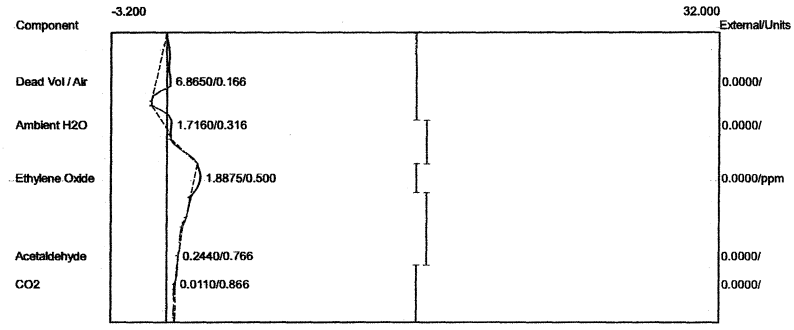
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	10.6540	0.0000	
Ambient H2O	0.316	0.9200	0.0000	
Ethylene Oxide	0.516	16.6750	0.0000	ppm
Acetaldehyde	0.666	0.3670	0.0000	
CO2	0.866	0.0680	0.0000	
		28.6840	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 08:00:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-C07.CHR (c:\peak359)
Sample: ~~10.1~~ ppm EtO std 1.10
Operator: D. Kremer



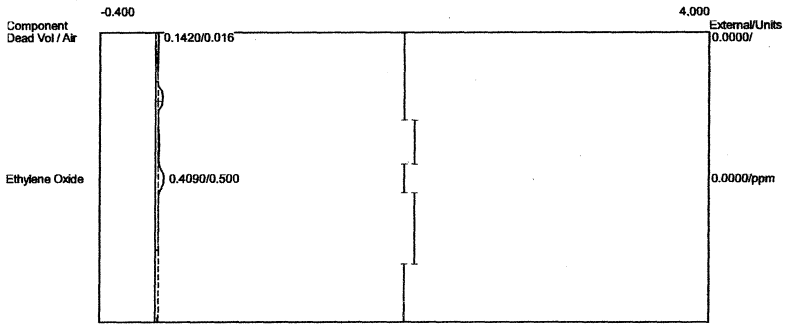
Component	Retention	Area	External	Units
Ethylene Oxide	0.500	0.4070	0.0000	ppm
		0.4070	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 08:00:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-C07.CHR (c:\peak359)
Sample: ~~10.1~~ ppm EtO std 1.10
Operator: D. Kremer



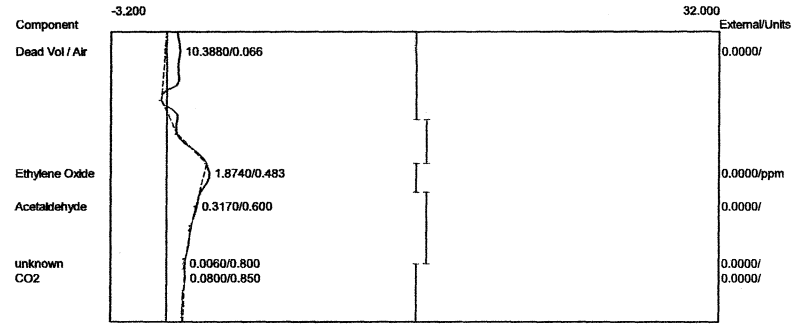
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	6.8650	0.0000	
Ambient H2O	0.316	1.7160	0.0000	
Ethylene Oxide	0.500	1.8875	0.0000	ppm
Acetaldehyde	0.766	0.2440	0.0000	
CO2	0.866	0.0110	0.0000	
		10.7235	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 08:05:27
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-C08.CHR (c:\peak359)
Sample: ~~10.1~~ ppm EtO std 1.10
Operator: D. Kremer



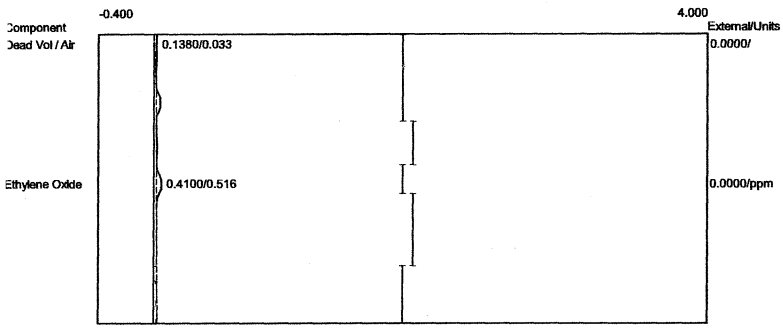
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	0.1420	0.0000	
Ethylene Oxide	0.500	0.4090	0.0000	ppm
		0.5510	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 08:05:27
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-C08.CHR (c:\peak359)
Sample: ~~10.1~~ ppm EtO std 1.10
Operator: D. Kremer



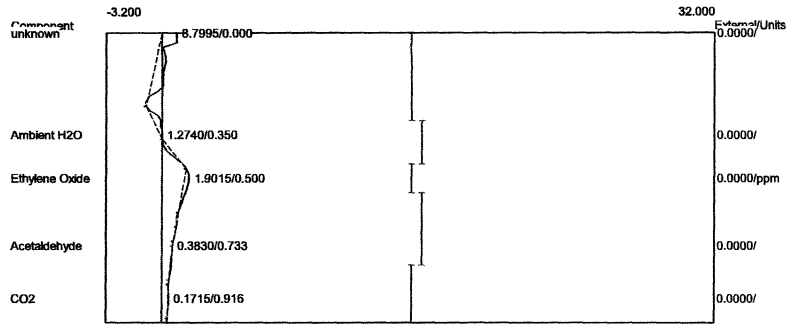
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	10.3880	0.0000	
Ethylene Oxide	0.483	1.8740	0.0000	ppm
Acetaldehyde	0.600	0.3170	0.0000	
CO2	0.850	0.0800	0.0000	
		12.6590	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 08:07:48
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-C09.CHR (c:\peak359)
Sample: ~~10.1~~ ppm EtO std 1.10
Operator: D. Kremer



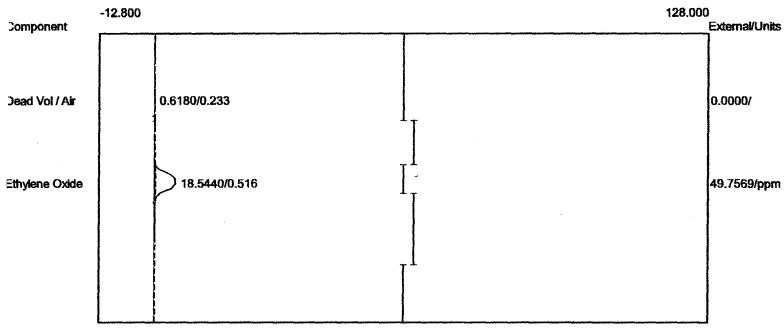
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	0.1380	0.0000	
Ethylene Oxide	0.516	0.4100	0.0000	ppm
		0.5480	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 08:07:48
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-C09.CHR (c:\peak359)
Sample: ~~10.1~~ ppm EtO std 1.10
Operator: D. Kremer



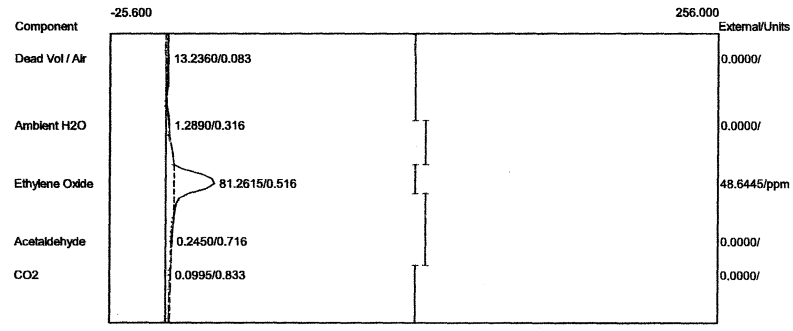
Component	Retention	Area	External	Units
Ambient H2O	0.350	1.2740	0.0000	
Ethylene Oxide	0.500	1.9015	0.0000	ppm
Acetaldehyde	0.733	0.3830	0.0000	
CO2	0.916	0.1715	0.0000	
		3.7300	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 08:07:44
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-C10.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



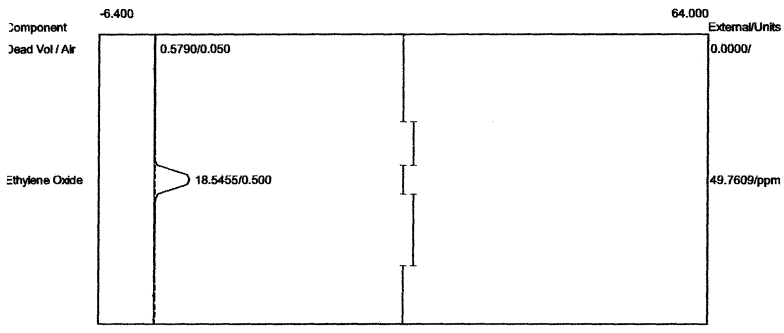
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	0.6180	0.0000	
Ethylene Oxide	0.516	18.5440	49.7569	ppm
		19.1620	49.7569	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 05/22/2018 08:07:44
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-C10.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



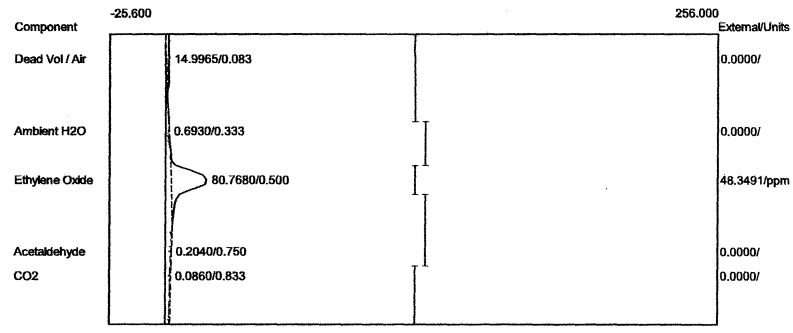
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	13.2360	0.0000	
Ambient H2O	0.316	1.2890	0.0000	
Ethylene Oxide	0.516	81.2615	48.6445	ppm
Acetaldehyde	0.716	0.2450	0.0000	
CO2	0.833	0.0995	0.0000	
		96.1310	48.6445	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PostCal
Analysis date: 05/22/2018 15:12:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-C11.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.050	0.5790	0.0000	
Ethylene Oxide	0.500	18.5455	49.7609	ppm
		19.1245	49.7609	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PostCal
Analysis date: 05/22/2018 15:12:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-C11.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer

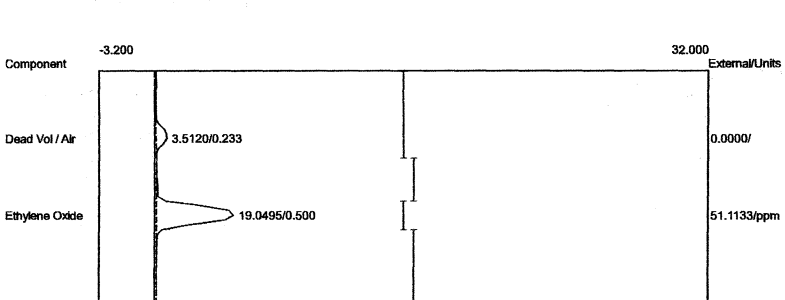


Component	Retention	Area	External	Units
Dead Vol / Air	0.083	14.9965	0.0000	
Ambient H2O	0.333	0.6930	0.0000	
Ethylene Oxide	0.500	80.7680	48.3491	ppm
Acetaldehyde	0.750	0.2040	0.0000	
CO2	0.833	0.0860	0.0000	
		96.7475	48.3491	

APPENDIX B

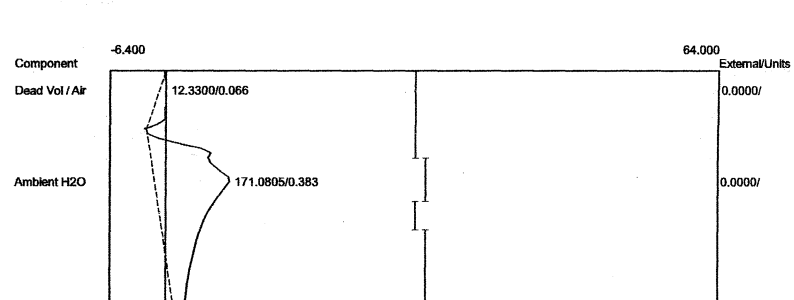
Run #1 Chromatograms - Backvent

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:49:49
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



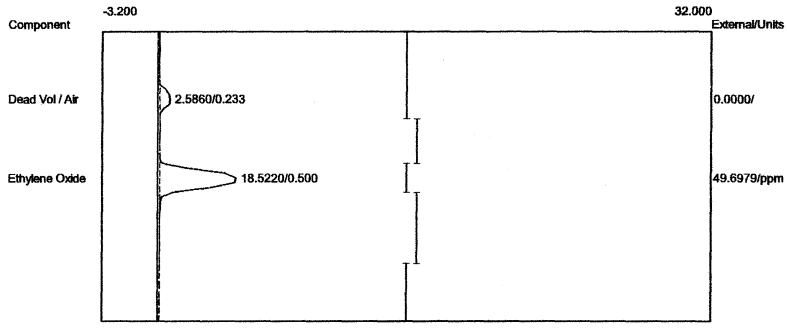
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.5120	0.0000	
Ethylene Oxide	0.500	19.0495	51.1133	ppm
		22.5615	51.1133	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:49:49
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



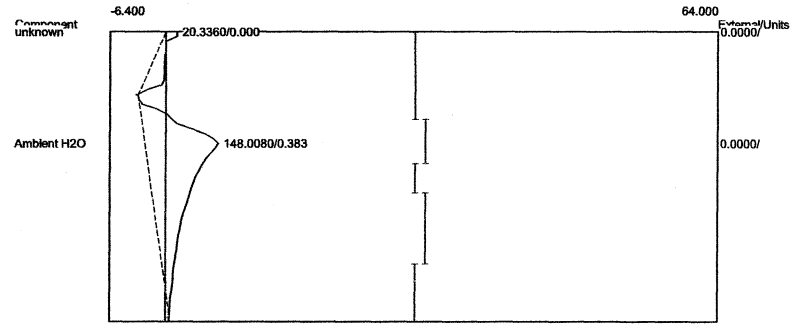
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	12.3300	0.0000	
Ambient H2O	0.383	171.0805	0.0000	
		183.4105	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:50:58
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



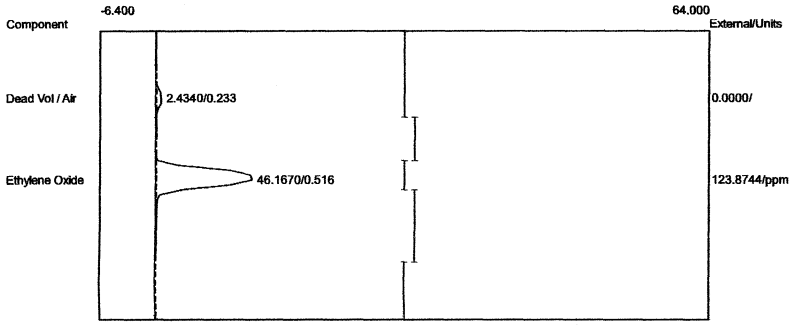
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5860	0.0000	
Ethylene Oxide	0.500	18.5220	49.6979	ppm
		21.1080	49.6979	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:50:58
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



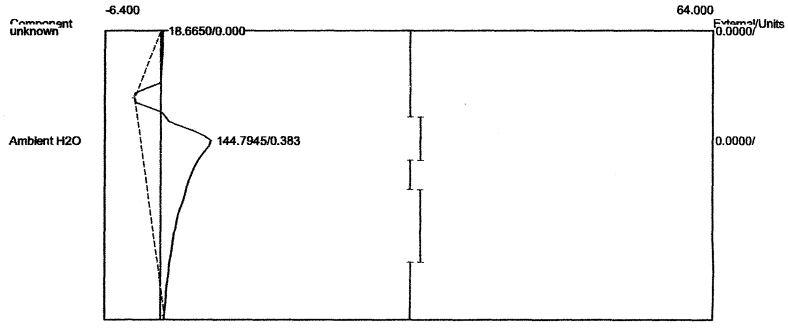
Component	Retention	Area	External	Units
Ambient H2O	0.383	148.0080	0.0000	
		148.0080	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:52:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



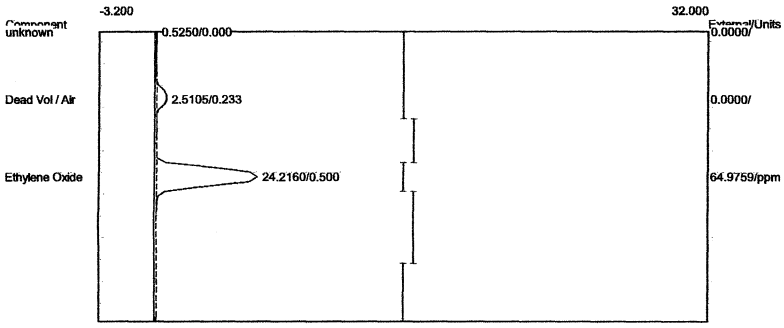
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.4340	0.0000	
Ethylene Oxide	0.516	46.1670	123.8744	ppm
		48.6010	123.8744	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:52:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



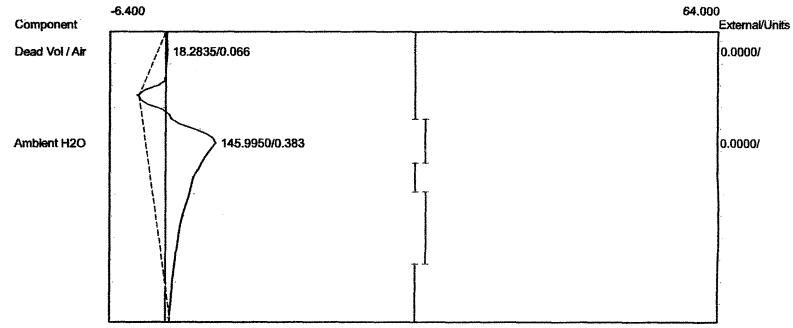
Component	Retention	Area	External	Units
Ambient H2O	0.383	144.7945	0.0000	
		144.7945	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:53:11
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



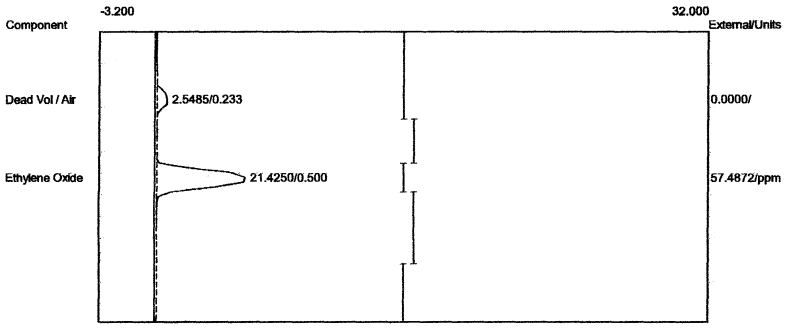
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5105	0.0000	
Ethylene Oxide	0.500	24.2160	64.9759	ppm
		26.7265	64.9759	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:53:11
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



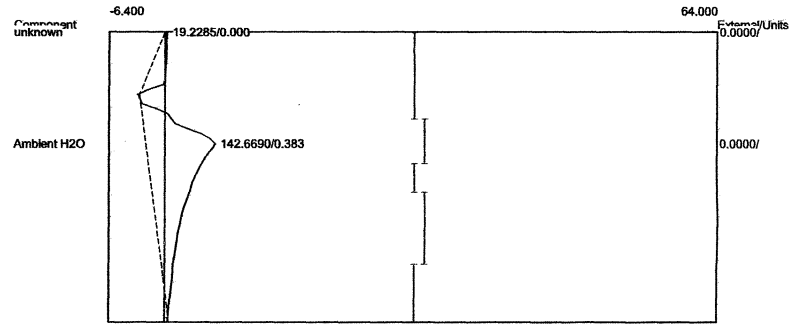
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	18.2835	0.0000	
Ambient H2O	0.383	145.9950	0.0000	
		164.2785	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:54:18
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



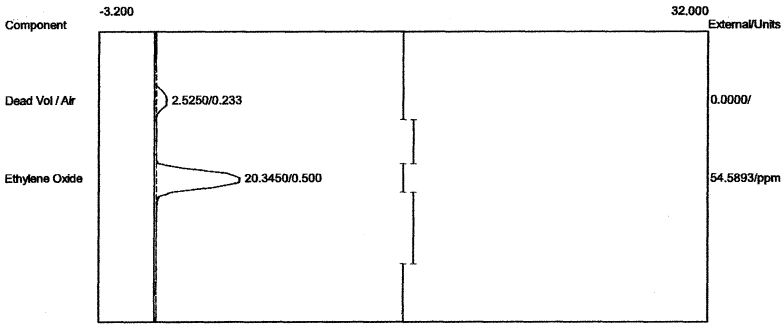
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5485	0.0000	
Ethylene Oxide	0.500	21.4250	57.4872	ppm
		23.9735	57.4872	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:54:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



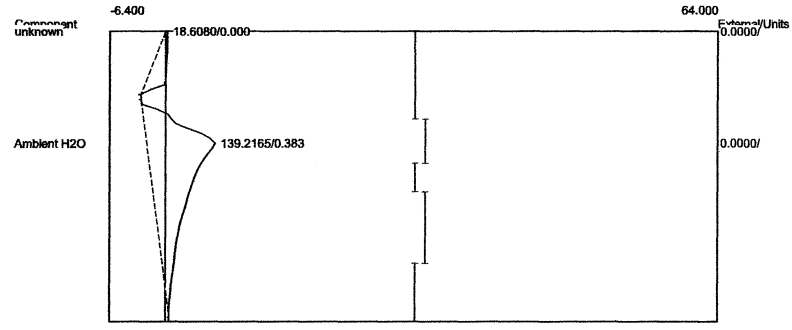
Component	Retention	Area	External	Units
Ambient H2O	0.383	142.6690	0.0000	
		142.6690	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:55:23
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



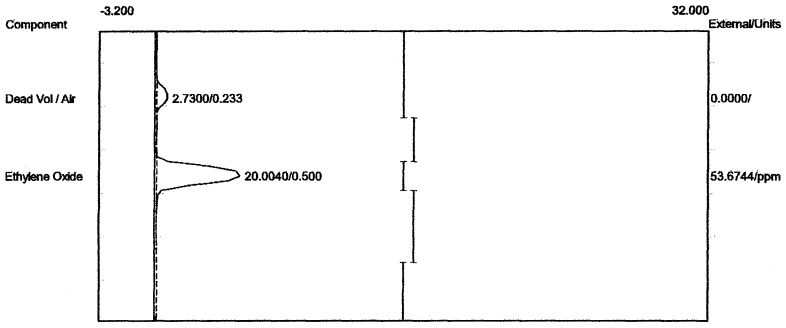
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5250	0.0000	
Ethylene Oxide	0.500	20.3450	54.5893	ppm
		22.8700	54.5893	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:55:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



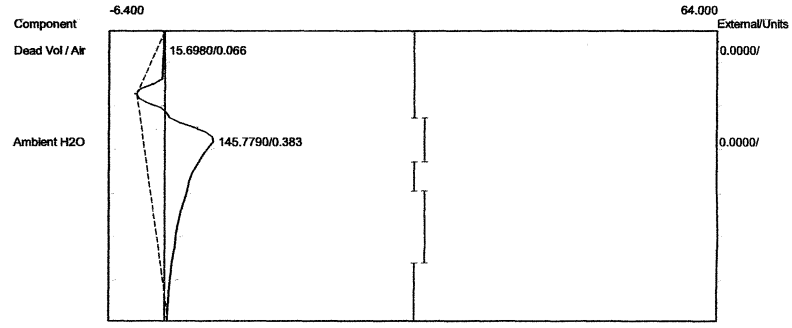
Component	Retention	Area	External	Units
Ambient H2O	0.383	139.2165	0.0000	
		139.2165	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:56:36
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



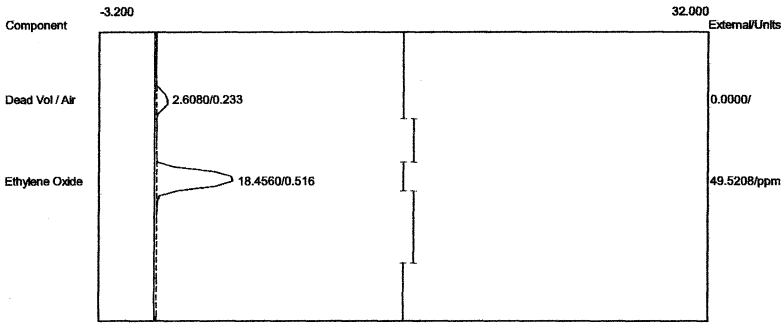
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.7300	0.0000	
Ethylene Oxide	0.500	20.0040	53.6744	ppm
		22.7340	53.6744	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:56:36
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



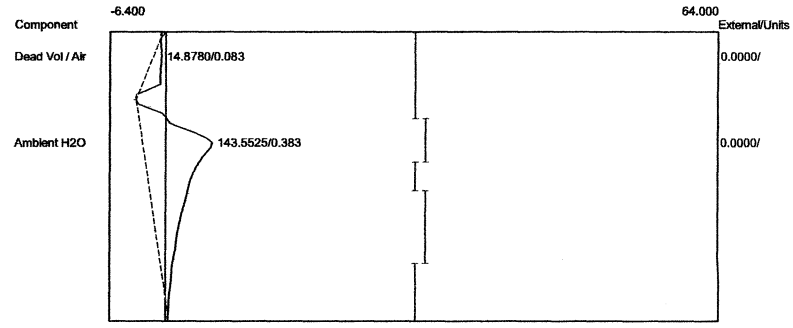
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	15.6980	0.0000	
Ambient H2O	0.383	145.7790	0.0000	
		161.4770	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:58:13
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



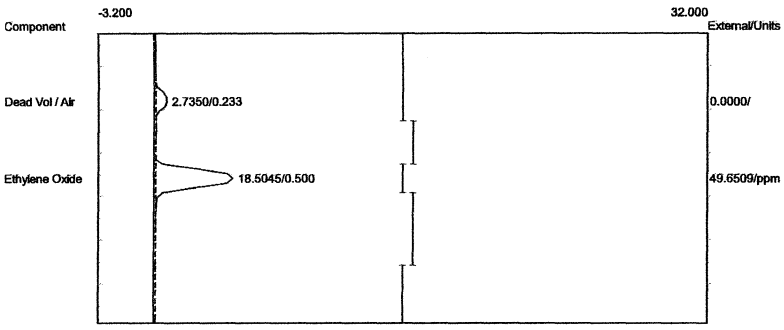
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6080	0.0000	
Ethylene Oxide	0.516	18.4560	49.5208	ppm
		21.0640	49.5208	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:58:13
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



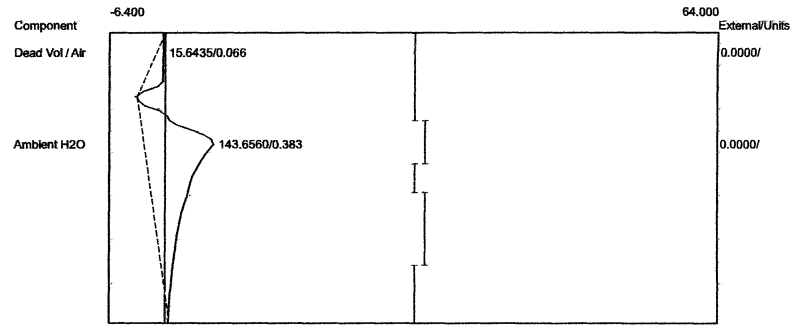
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	14.8780	0.0000	
Ambient H2O	0.383	143.5525	0.0000	
		158.4305	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:59:27
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



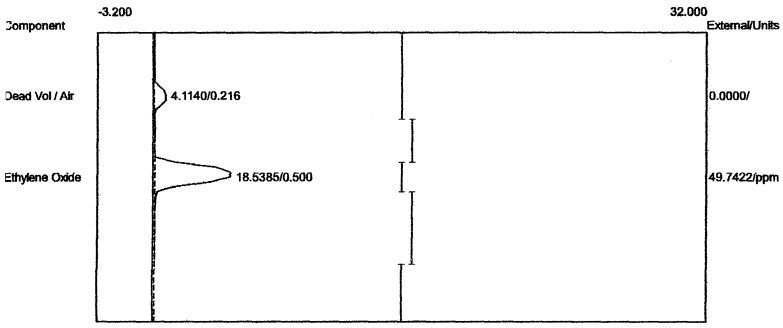
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.7350	0.0000	
Ethylene Oxide	0.500	18.5045	49.6509	ppm
		21.2395	49.6509	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 08:59:27
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



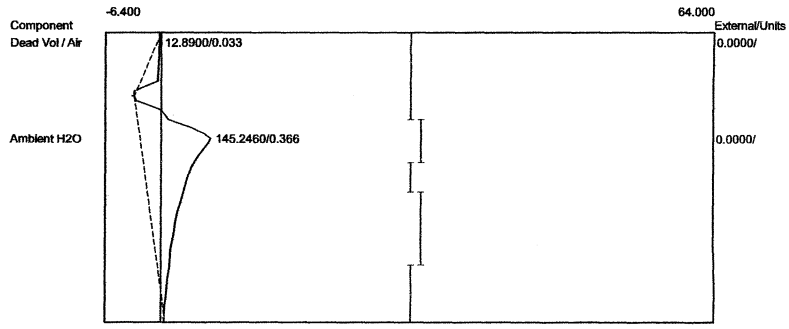
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	15.6435	0.0000	
Ambient H2O	0.383	143.6560	0.0000	
		159.2995	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 09:00:46
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



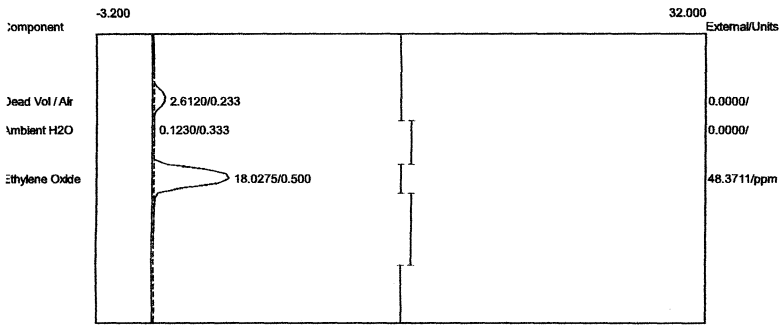
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	4.1140	0.0000	
Ethylene Oxide	0.500	18.5385	49.7422	ppm
		22.6525	49.7422	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 09:00:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



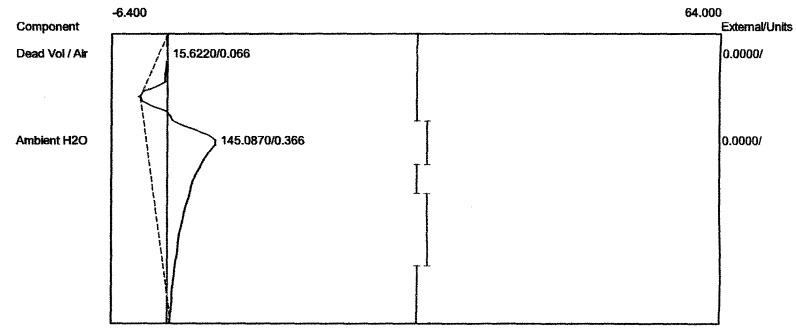
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	12.8900	0.0000	
Ambient H2O	0.366	145.2460	0.0000	
		158.1360	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 09:01:57
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



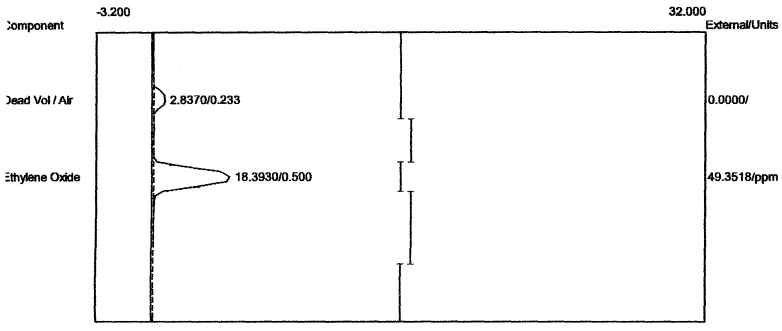
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6120	0.0000	
Ambient H2O	0.333	0.1230	0.0000	
Ethylene Oxide	0.500	18.0275	48.3711	ppm
		20.7625	48.3711	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 09:01:57
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



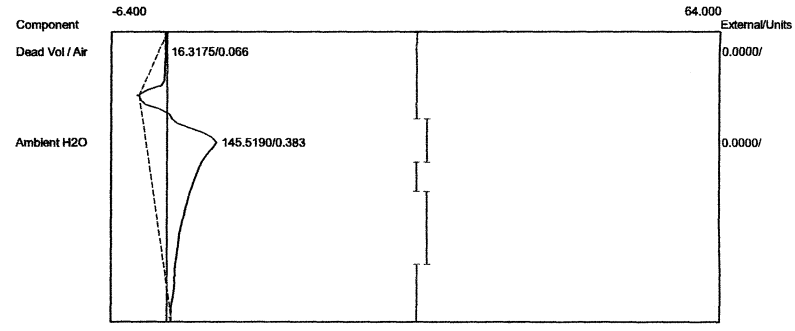
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	15.6220	0.0000	
Ambient H2O	0.366	145.0870	0.0000	
		160.7090	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 09:03:18
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1B12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.8370	0.0000	
Ethylene Oxide	0.500	18.3930	49.3518	ppm
		21.2300	49.3518	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 05/22/2018 09:03:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1B12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer

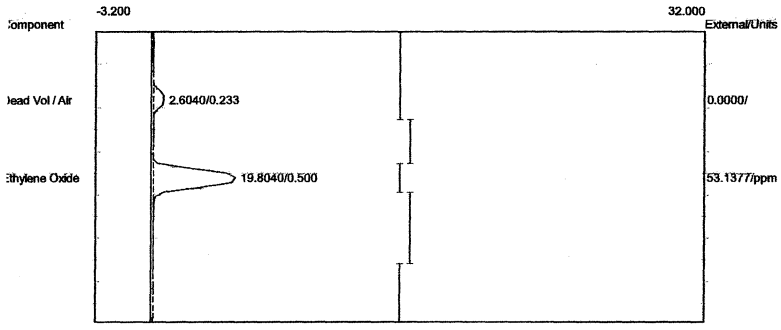


Component	Retention	Area	External	Units
Dead Vol / Air	0.066	16.3175	0.0000	
Ambient H2O	0.383	145.5190	0.0000	
		161.8365	0.0000	

APPENDIX C

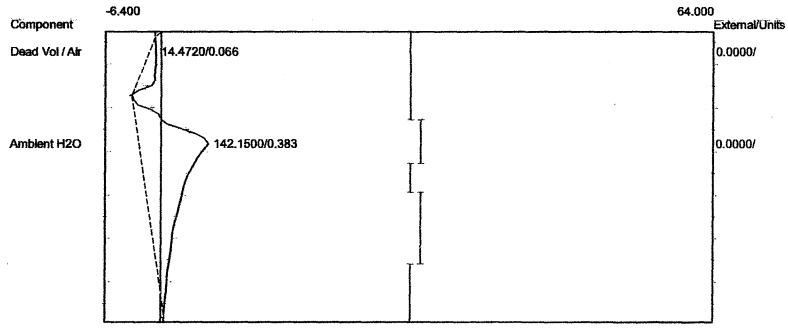
Run #1 Chromatograms - Aeration

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:27:30
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



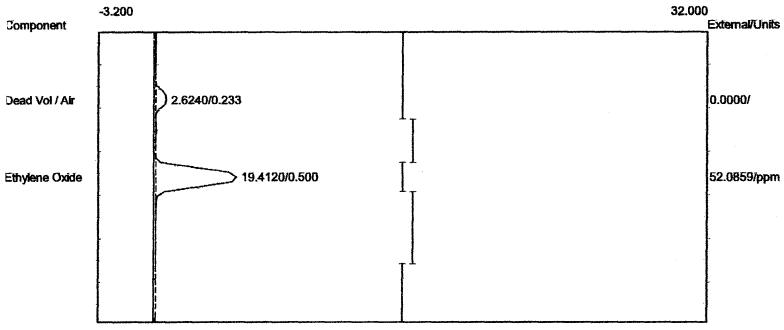
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6040	0.0000	
Ethylene Oxide	0.500	19.8040	53.1377	ppm
		22.4080	53.1377	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:27:30
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



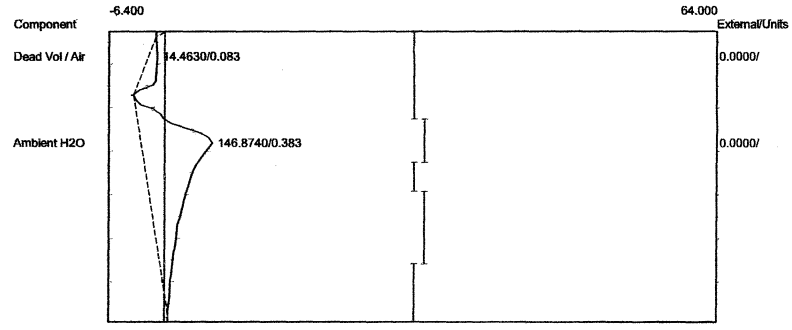
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	14.4720	0.0000	
Ambient H2O	0.383	142.1500	0.0000	
		156.6220	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:32:54
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



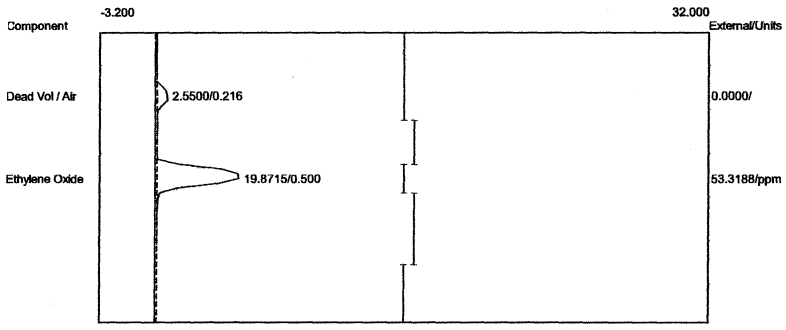
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6240	0.0000	
Ethylene Oxide	0.500	19.4120	52.0859	ppm
		22.0360	52.0859	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:32:54
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



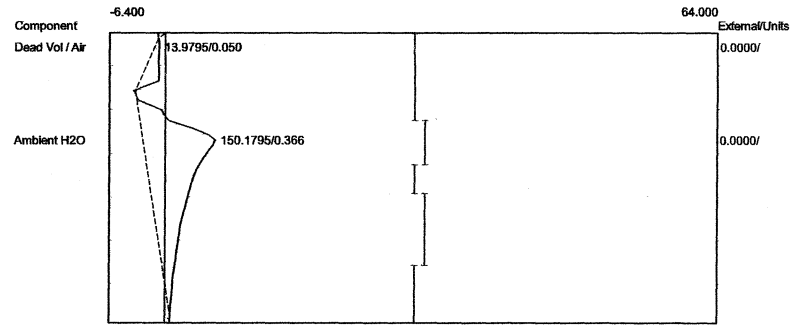
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	14.4630	0.0000	
Ambient H2O	0.383	146.8740	0.0000	
		161.3370	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:37:33
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



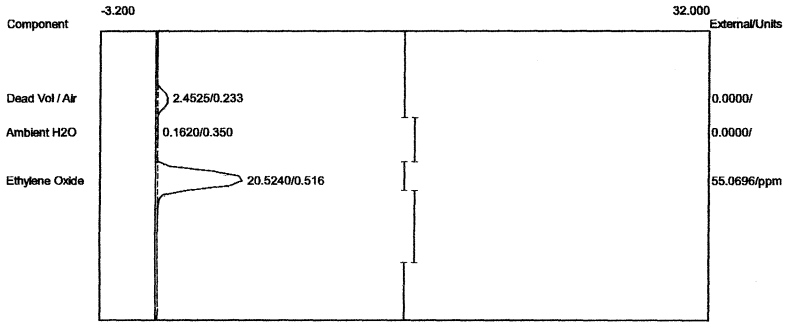
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	2.5500	0.0000	
Ethylene Oxide	0.500	19.8715	53.3188	ppm
		22.4215	53.3188	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:37:33
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



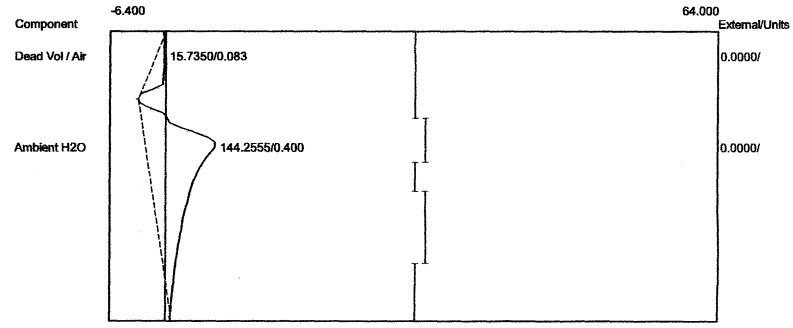
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	13.9795	0.0000	
Ambient H2O	0.366	150.1795	0.0000	
		164.1590	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:42:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



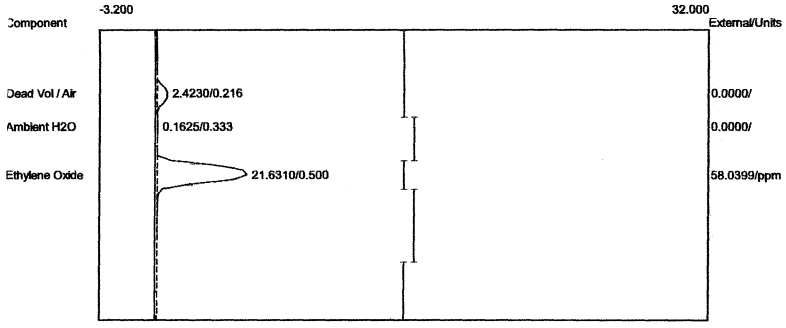
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.4525	0.0000	
Ambient H2O	0.350	0.1620	0.0000	
Ethylene Oxide	0.516	20.5240	55.0696	ppm
		23.1385	55.0696	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:42:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



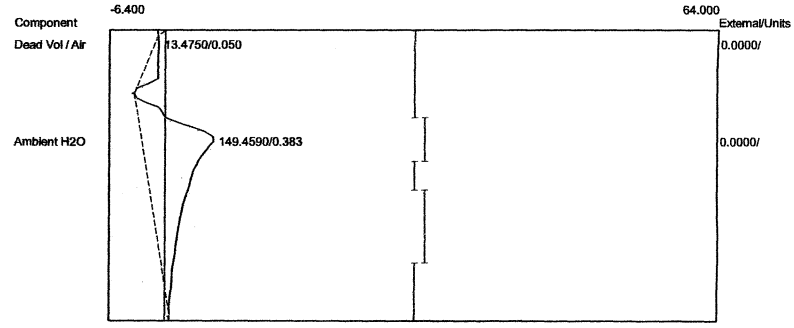
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	15.7350	0.0000	
Ambient H2O	0.400	144.2555	0.0000	
		159.9905	0.0000	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:47:33
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



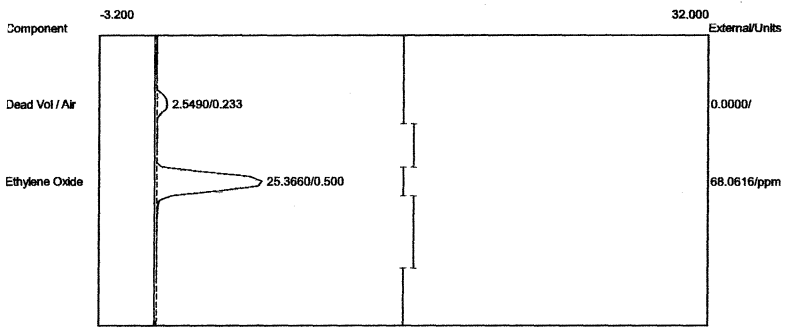
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	2.4230	0.0000	
Ambient H2O	0.333	0.1625	0.0000	
Ethylene Oxide	0.500	21.6310	58.0399	ppm
		24.2165	58.0399	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:47:33
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



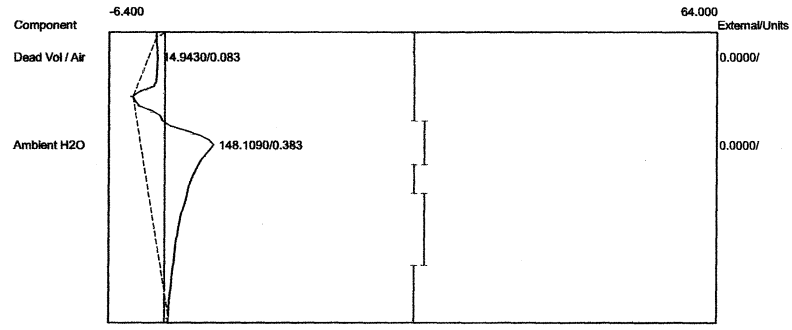
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	13.4750	0.0000	
Ambient H2O	0.383	149.4590	0.0000	
		162.9340	0.0000	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:52:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



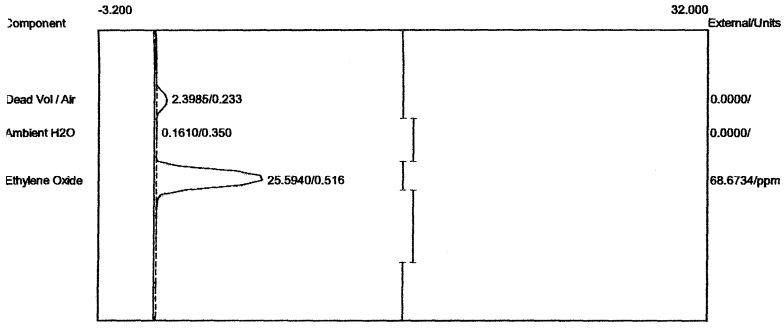
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5490	0.0000	
Ethylene Oxide	0.500	25.3660	68.0616	ppm
		27.9150	68.0616	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:52:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



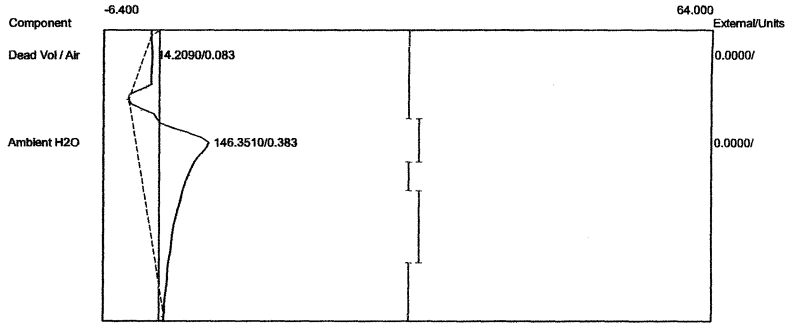
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	14.9430	0.0000	
Ambient H2O	0.383	148.1090	0.0000	
		163.0520	0.0000	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:57:11
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



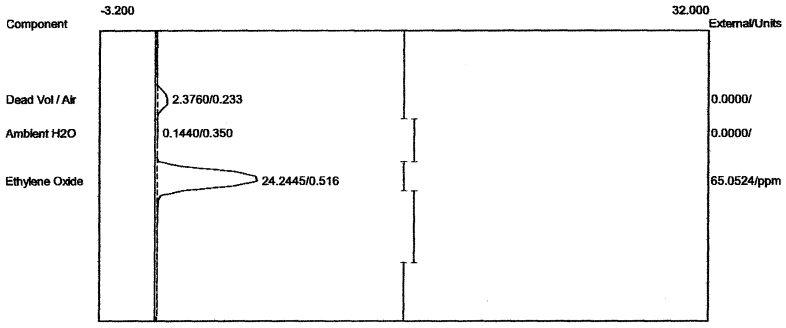
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.3985	0.0000	
Ambient H2O	0.350	0.1610	0.0000	
Ethylene Oxide	0.516	25.5940	68.6734	ppm
		28.1535	68.6734	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 09:57:11
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



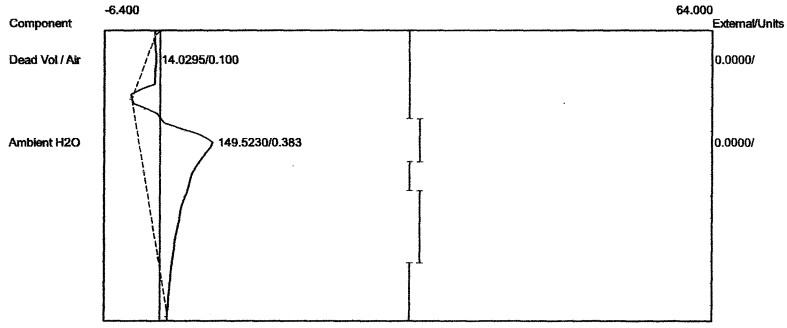
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	14.2090	0.0000	
Ambient H2O	0.383	146.3510	0.0000	
		160.5600	0.0000	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 10:02:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



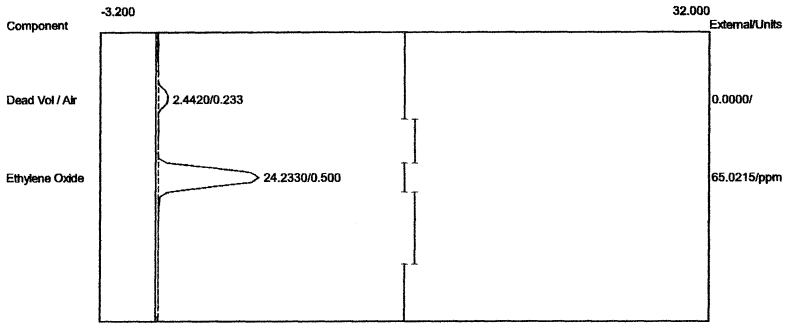
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.3760	0.0000	
Ambient H2O	0.350	0.1440	0.0000	
Ethylene Oxide	0.516	24.2445	65.0524	ppm
		26.7645	65.0524	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 10:02:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



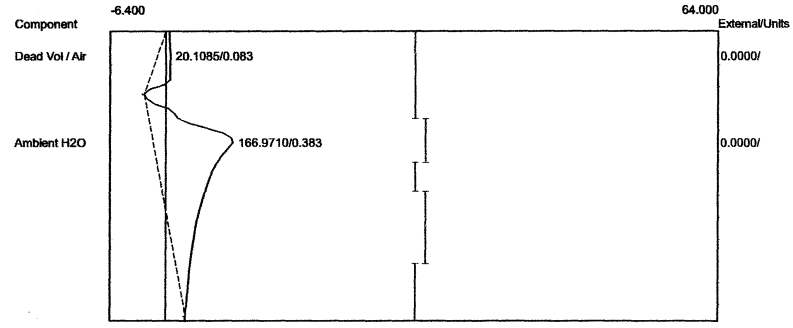
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	14.0295	0.0000	
Ambient H2O	0.383	149.5230	0.0000	
		163.5525	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 10:07:01
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



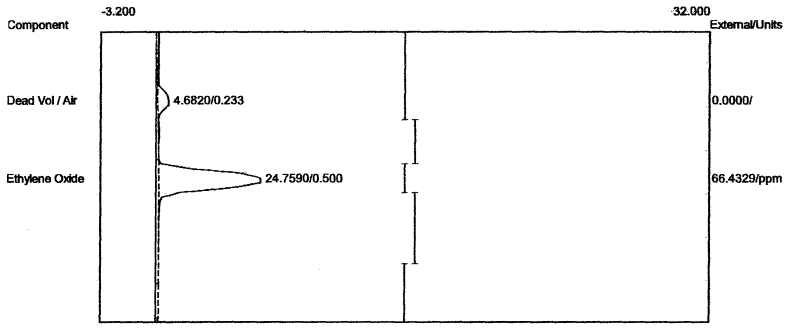
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.4420	0.0000	
Ethylene Oxide	0.500	24.2330	65.0215	ppm
		26.6750	65.0215	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 10:07:01
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



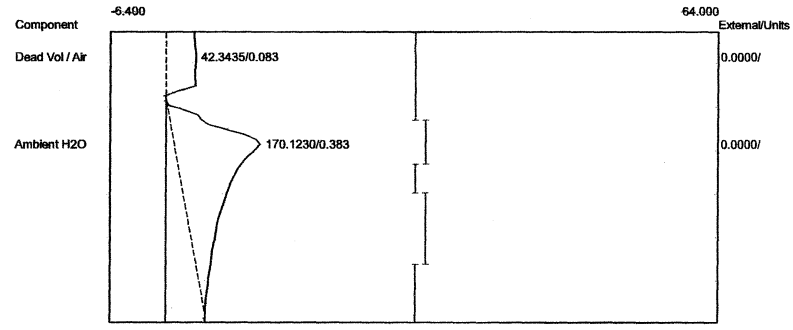
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	20.1085	0.0000	
Ambient H2O	0.383	166.9710	0.0000	
		187.0795	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 10:12:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



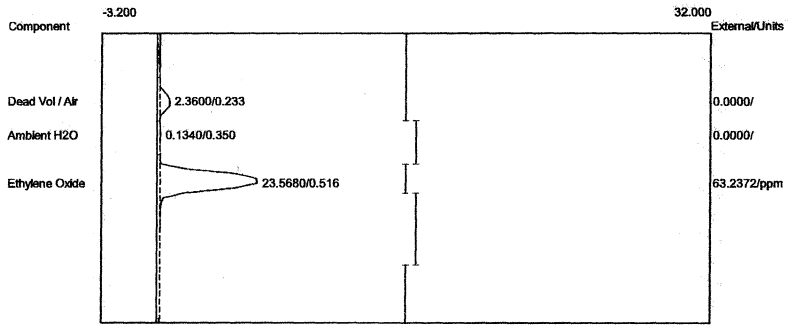
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	4.6820	0.0000	
Ethylene Oxide	0.500	24.7590	66.4329	ppm
		29.4410	66.4329	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 10:12:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



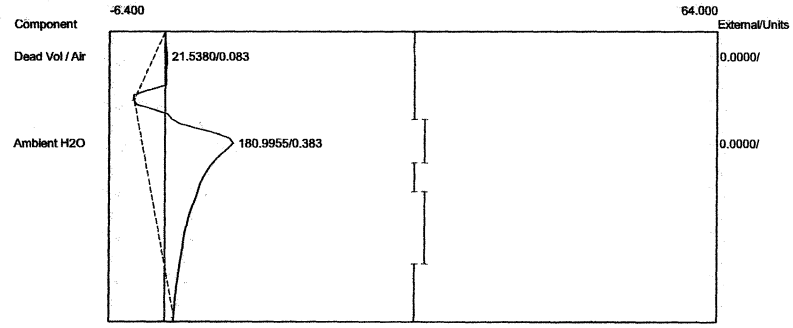
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	42.3435	0.0000	
Ambient H2O	0.383	170.1230	0.0000	
		212.4665	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 10:17:26
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



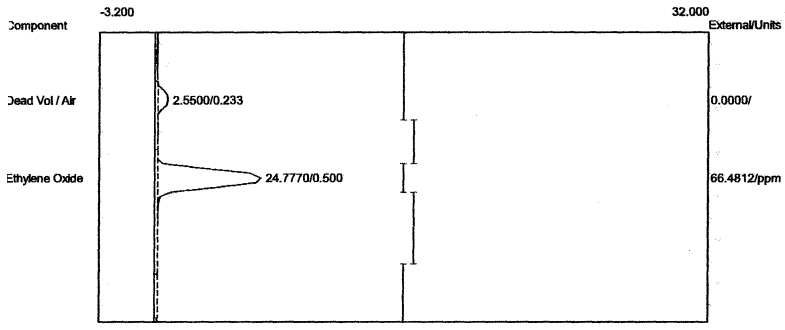
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.3600	0.0000	
Ambient H2O	0.350	0.1340	0.0000	
Ethylene Oxide	0.516	23.5680	63.2372	ppm
		26.0620	63.2372	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 10:17:26
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



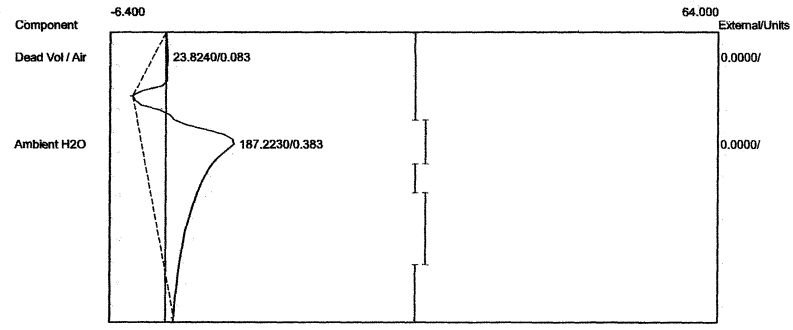
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	21.5380	0.0000	
Ambient H2O	0.383	180.9955	0.0000	
		202.5335	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 10:22:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-1A12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5500	0.0000	
Ethylene Oxide	0.500	24.7770	66.4812	ppm
		27.3270	66.4812	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 05/22/2018 10:22:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-1A12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer

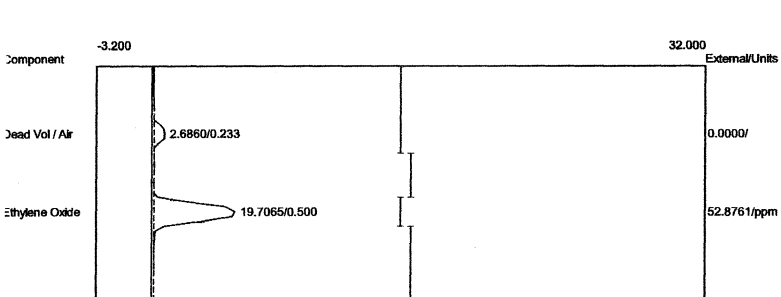


Component	Retention	Area	External	Units
Dead Vol / Air	0.083	23.8240	0.0000	
Ambient H2O	0.383	187.2230	0.0000	
		211.0470	0.0000	

APPENDIX D

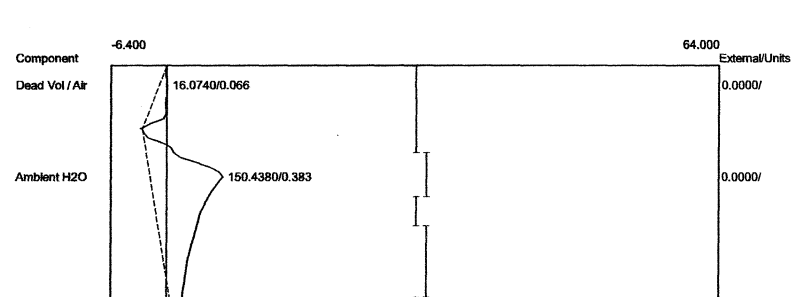
Run #2 Chromatograms - Backvent

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:11:23
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



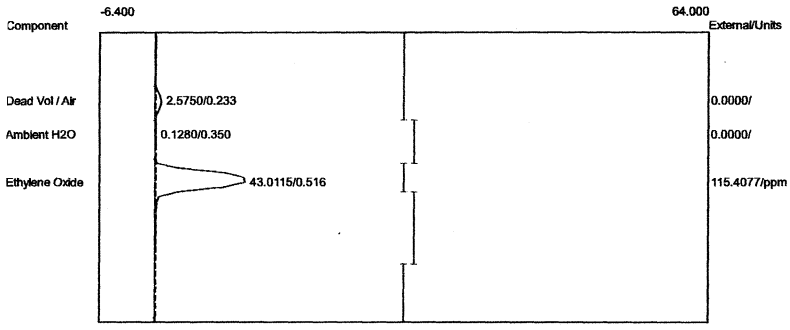
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6860	0.0000	
Ethylene Oxide	0.500	19.7065	52.8761	ppm
		22.3925	52.8761	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:11:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



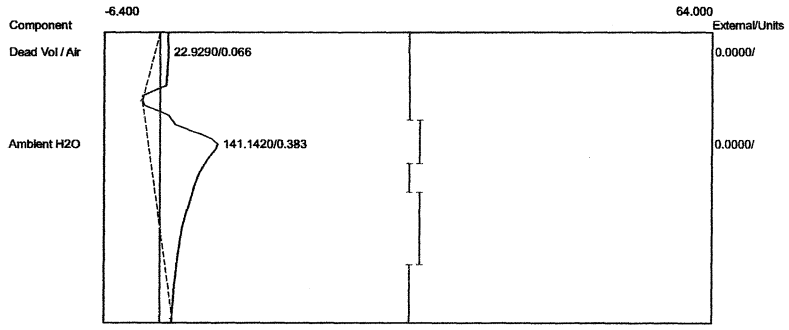
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	16.0740	0.0000	
Ambient H2O	0.383	150.4380	0.0000	
		166.5120	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:12:32
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



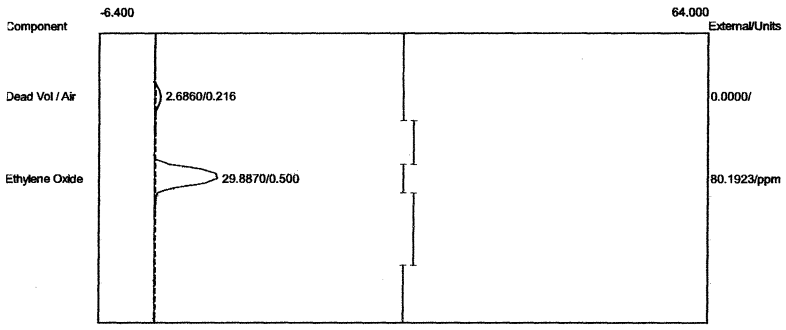
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5750	0.0000	
Ambient H2O	0.350	0.1280	0.0000	
Ethylene Oxide	0.516	43.0115	115.4077	ppm
		45.7145	115.4077	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:12:32
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



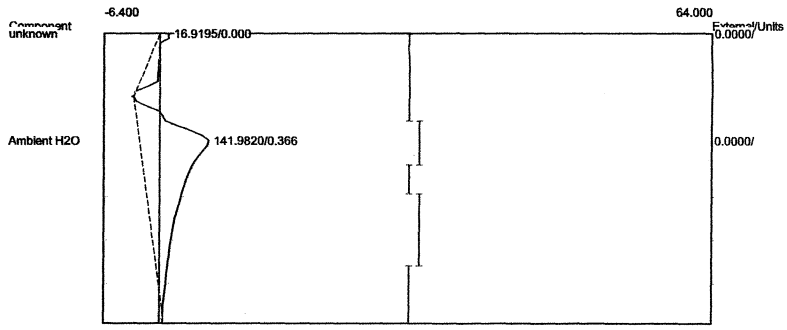
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	22.9290	0.0000	
Ambient H2O	0.383	141.1420	0.0000	
		164.0710	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:13:41
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



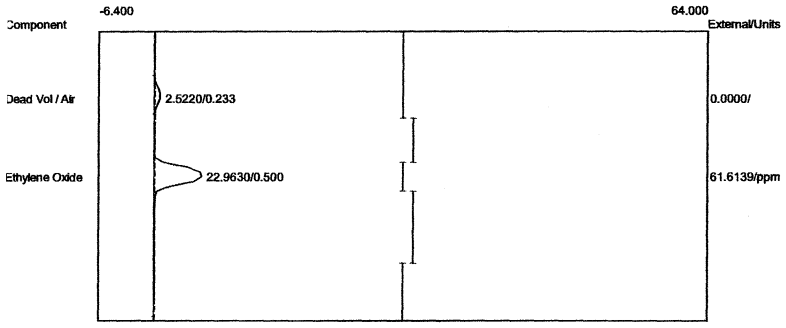
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	2.6860	0.0000	
Ethylene Oxide	0.500	29.8870	80.1923	ppm
		32.5730	80.1923	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:13:41
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



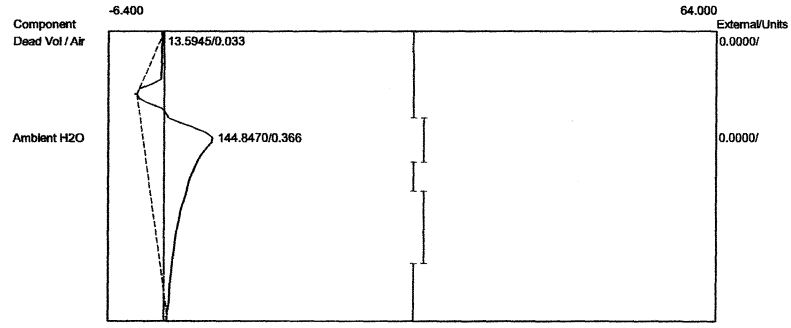
Component	Retention	Area	External	Units
Ambient H2O	0.366	141.9820	0.0000	
		141.9820	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:15:01
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



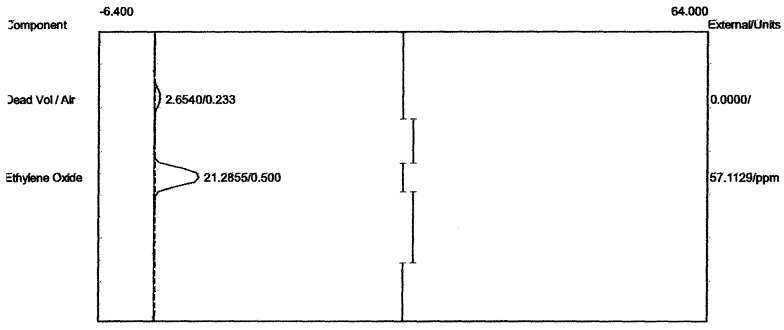
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5220	0.0000	
Ethylene Oxide	0.500	22.9630	61.6139	ppm
		25.4850	61.6139	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:15:01
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



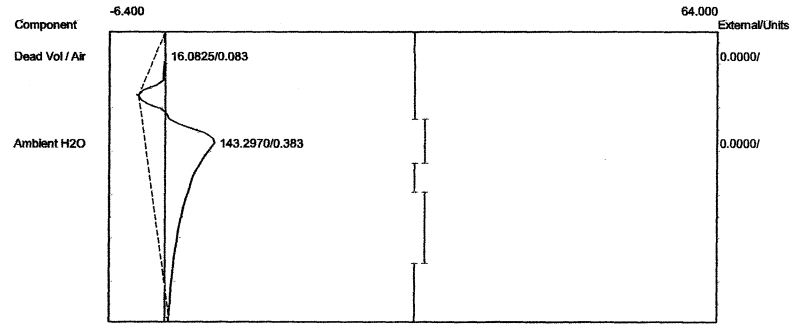
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	13.5945	0.0000	
Ambient H2O	0.366	144.8470	0.0000	
		158.4415	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:16:13
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



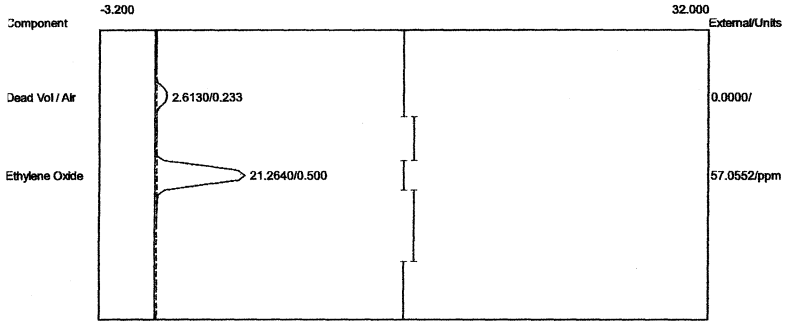
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6540	0.0000	
Ethylene Oxide	0.500	21.2855	57.1129	ppm
		23.9395	57.1129	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:16:13
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



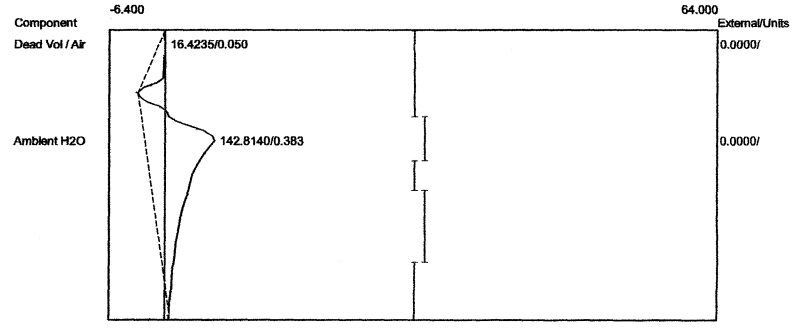
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	16.0825	0.0000	
Ambient H2O	0.383	143.2970	0.0000	
		159.3795	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:17:29
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



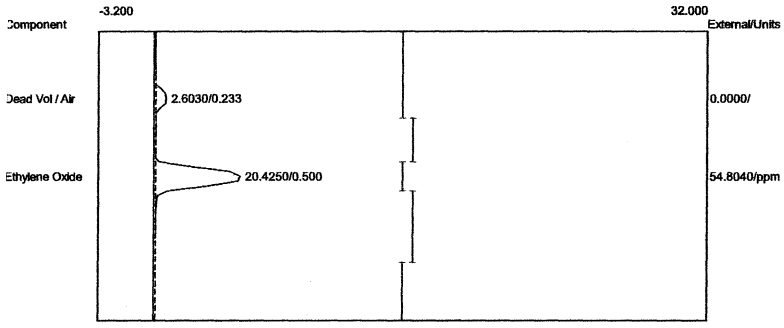
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6130	0.0000	
Ethylene Oxide	0.500	21.2640	57.0552	ppm
		23.8770	57.0552	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:17:29
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



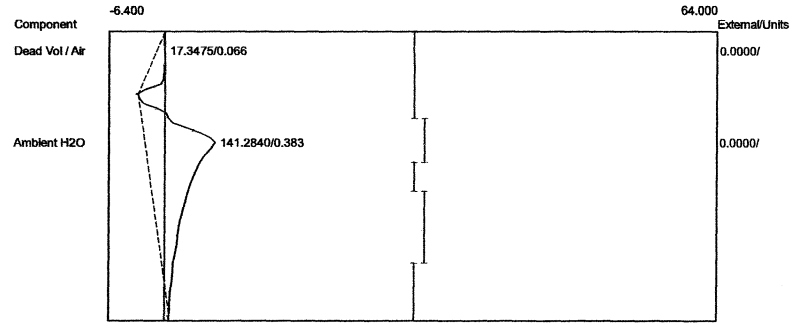
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	16.4235	0.0000	
Ambient H2O	0.383	142.8140	0.0000	
		159.2375	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:18:44
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



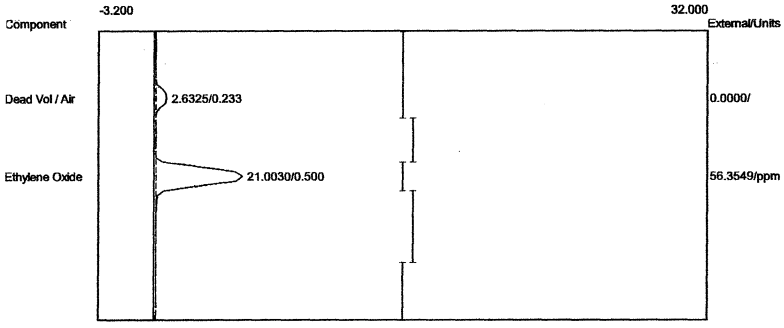
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6030	0.0000	
Ethylene Oxide	0.500	20.4250	54.8040	ppm
		23.0280	54.8040	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:18:44
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



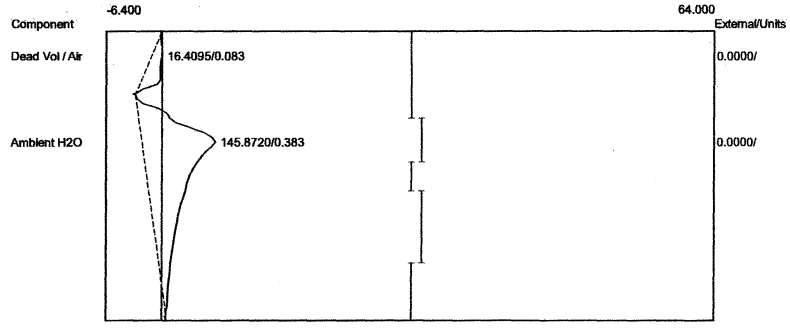
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	17.3475	0.0000	
Ambient H2O	0.383	141.2840	0.0000	
		158.6315	0.0000	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:20:01
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



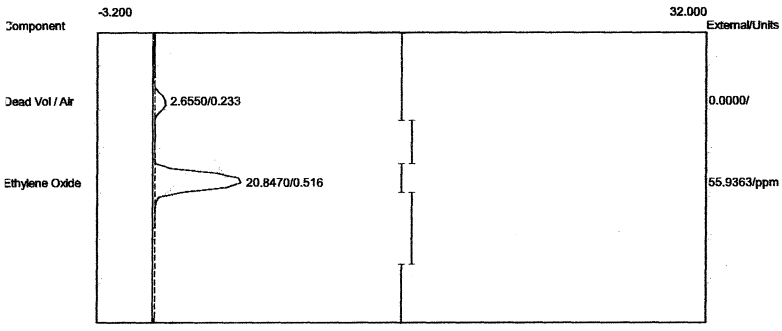
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6325	0.0000	
Ethylene Oxide	0.500	21.0030	56.3549	ppm
		23.6355	56.3549	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:20:01
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



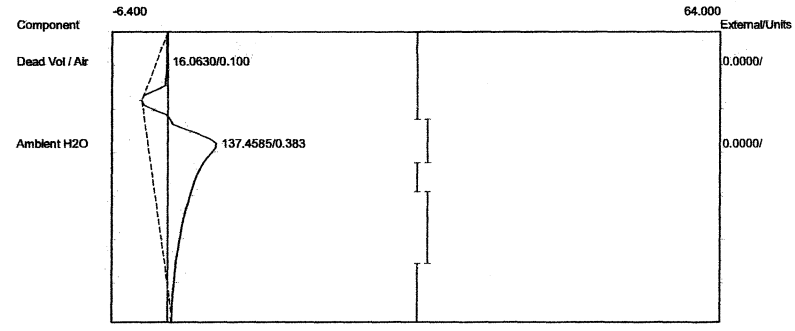
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	16.4095	0.0000	
Ambient H2O	0.383	145.8720	0.0000	
		162.2815	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:21:18
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



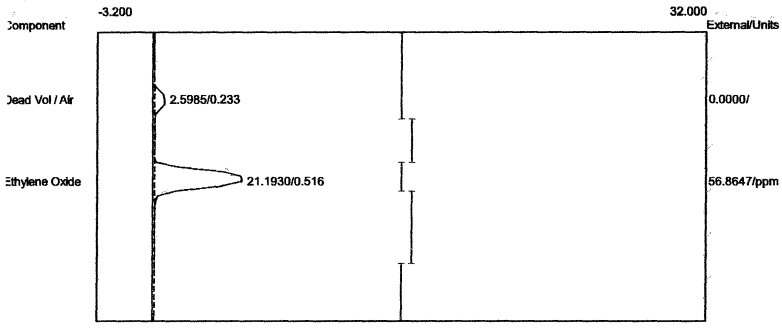
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6550	0.0000	
Ethylene Oxide	0.516	20.8470	55.9363	ppm
		23.5020	55.9363	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:21:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



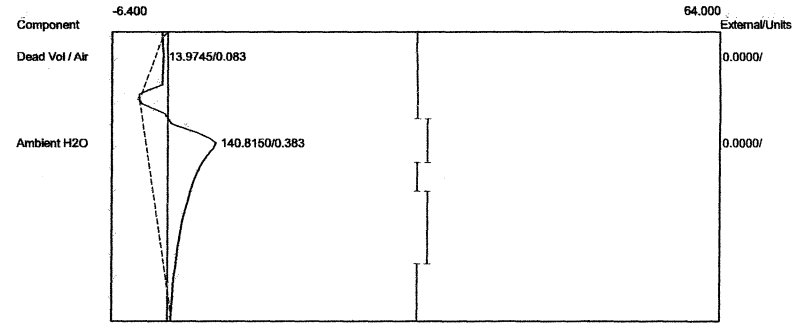
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	16.0630	0.0000	
Ambient H2O	0.383	137.4585	0.0000	
		153.5215	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:23:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



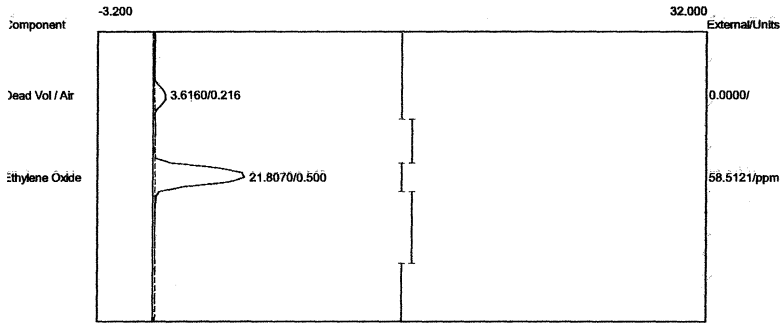
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5985	0.0000	
Ethylene Oxide	0.516	21.1930	56.8647	ppm
		23.7915	56.8647	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:23:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



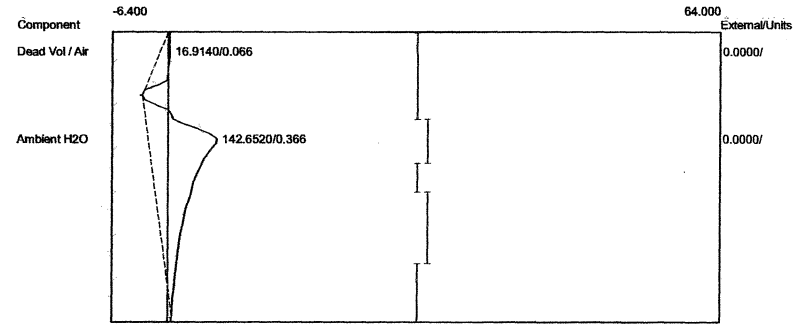
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	13.9745	0.0000	
Ambient H2O	0.383	140.8150	0.0000	
		154.7895	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:24:11
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



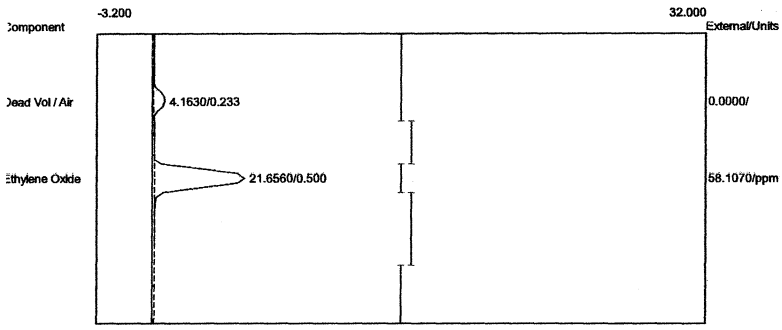
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.6160	0.0000	
Ethylene Oxide	0.500	21.8070	58.5121	ppm
		25.4230	58.5121	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:24:11
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



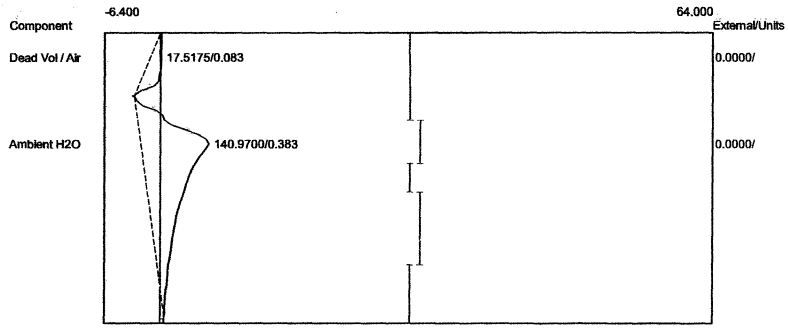
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	16.9140	0.0000	
Ambient H2O	0.366	142.6520	0.0000	
		159.5660	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:25:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2B12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	4.1630	0.0000	
Ethylene Oxide	0.500	21.6560	58.1070	ppm
		25.8190	58.1070	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 05/22/2018 09:25:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2B12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer

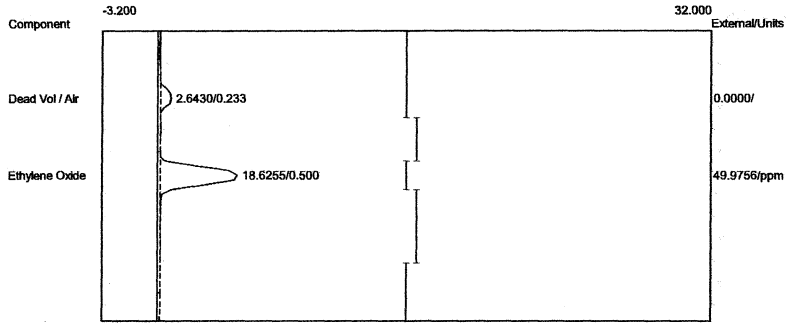


Component	Retention	Area	External	Units
Dead Vol / Air	0.083	17.5175	0.0000	
Ambient H2O	0.383	140.9700	0.0000	
		158.4875	0.0000	

APPENDIX E

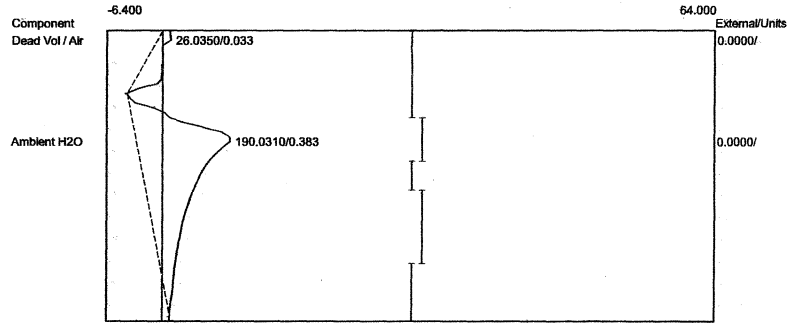
Run #2 Chromatograms - Aeration

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:27:43
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



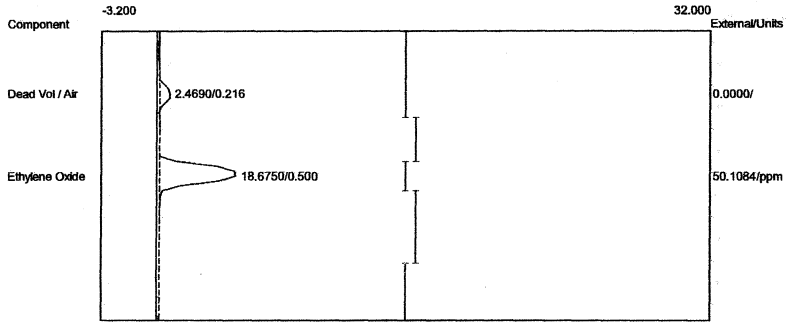
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6430	0.0000	
Ethylene Oxide	0.500	18.6255	49.9756	ppm
		21.2685	49.9756	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:27:43
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



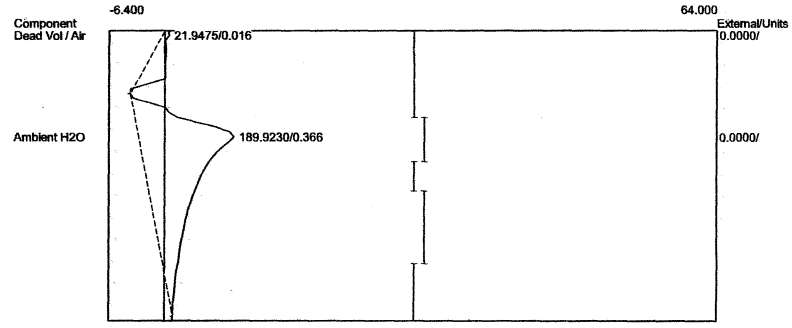
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	26.0350	0.0000	
Ambient H2O	0.383	190.0310	0.0000	
		216.0660	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:32:18
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



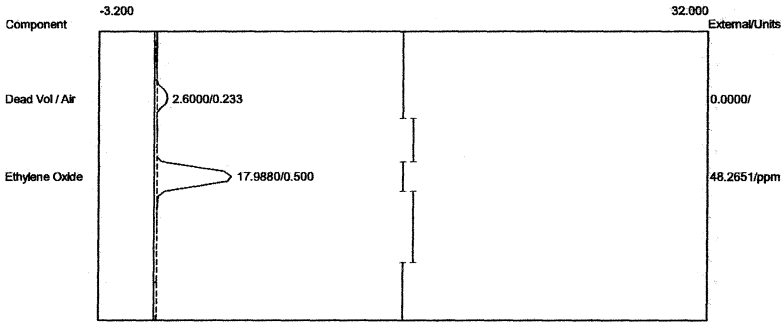
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	2.4690	0.0000	
Ethylene Oxide	0.500	18.6750	50.1084	ppm
		21.1440	50.1084	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:32:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



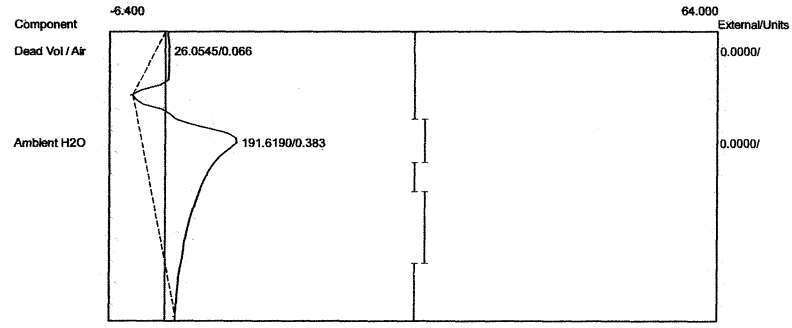
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	21.9475	0.0000	
Ambient H2O	0.366	189.9230	0.0000	
		211.8705	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:37:09
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



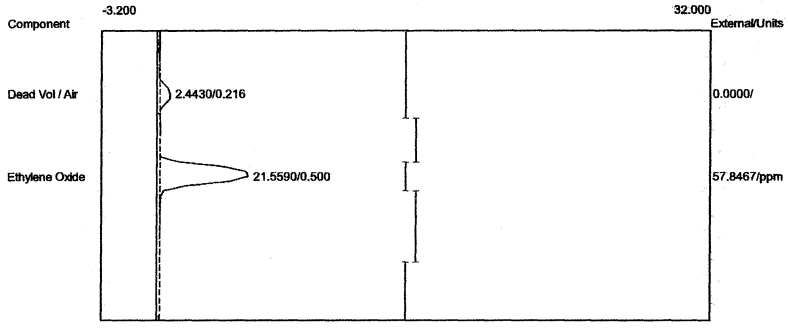
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6000	0.0000	
Ethylene Oxide	0.500	17.9880	48.2651	ppm
		20.5880	48.2651	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:37:09
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



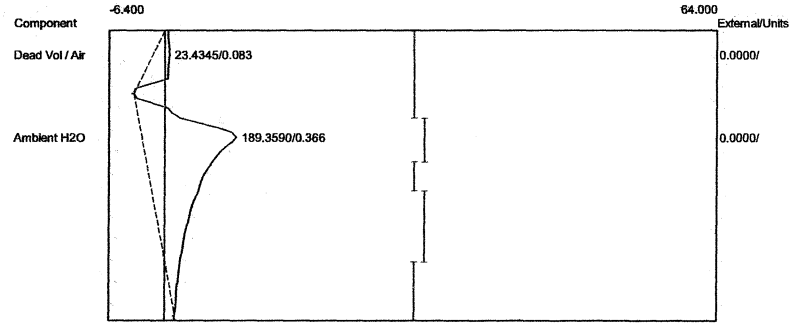
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	26.0545	0.0000	
Ambient H2O	0.383	191.6190	0.0000	
		217.6735	0.0000	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:42:23
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



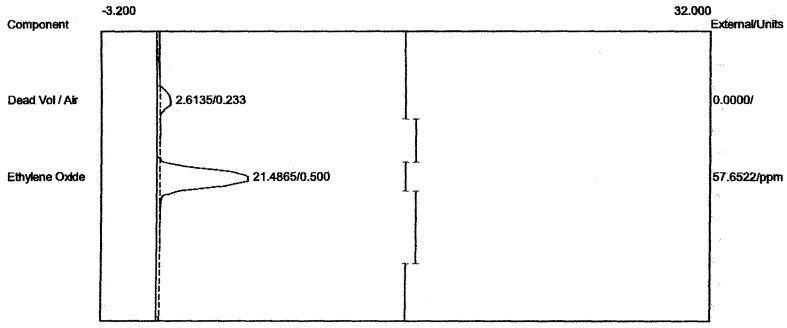
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	2.4430	0.0000	
Ethylene Oxide	0.500	21.5590	57.8467	ppm
		24.0020	57.8467	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:42:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



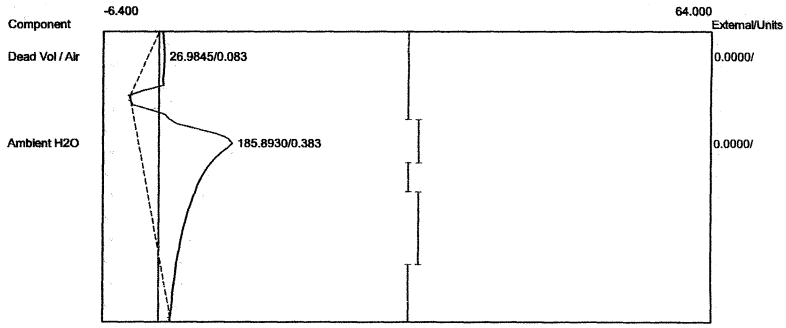
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	23.4345	0.0000	
Ambient H2O	0.366	189.3590	0.0000	
		212.7935	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:47:25
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



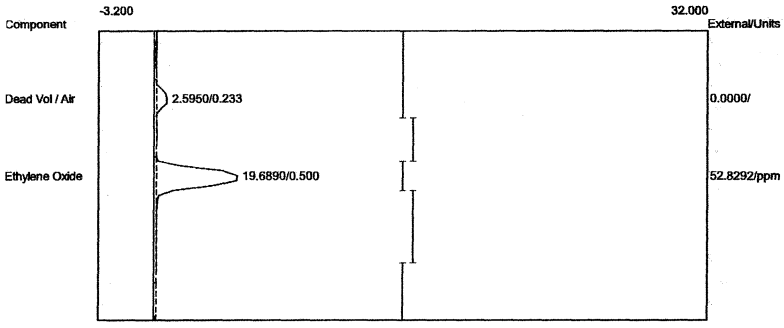
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6135	0.0000	
Ethylene Oxide	0.500	21.4865	57.6522	ppm
		24.1000	57.6522	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:47:25
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



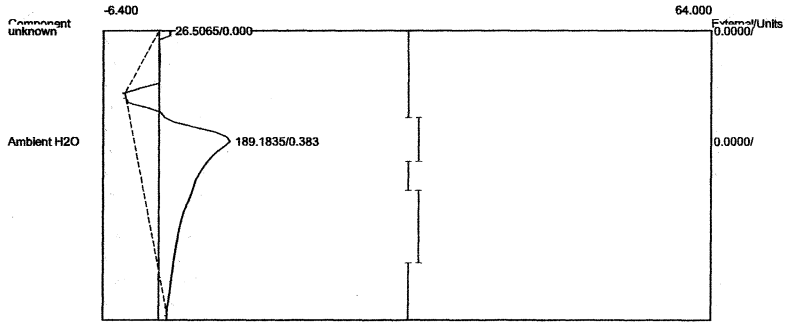
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	26.9845	0.0000	
Ambient H2O	0.383	185.8930	0.0000	
		212.8775	0.0000	

Lab Name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:52:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



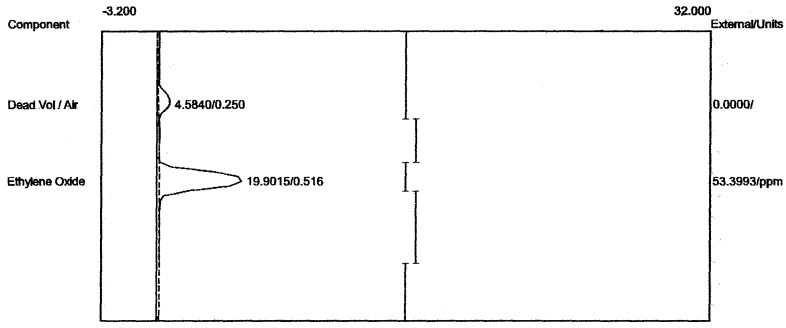
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5950	0.0000	
Ethylene Oxide	0.500	19.6890	52.8292	ppm
		22.2840	52.8292	

Lab Name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:52:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



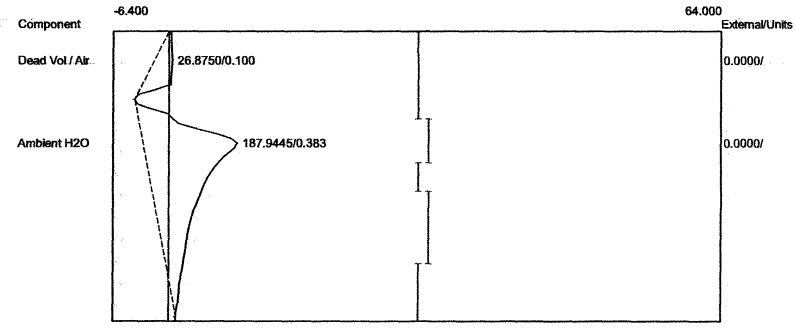
Component	Retention	Area	External	Units
Ambient H2O	0.383	189.1835	0.0000	
		189.1835	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:57:31
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



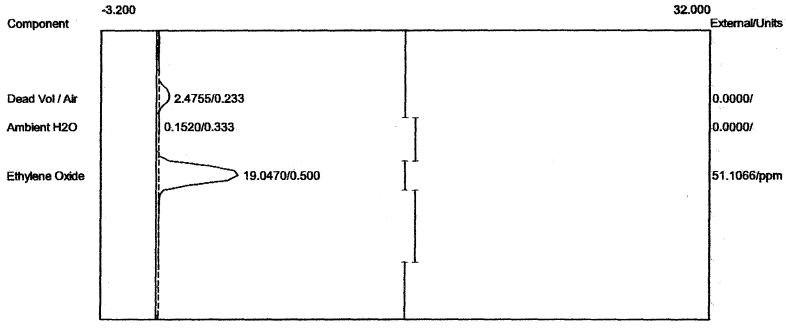
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	4.5840	0.0000	
Ethylene Oxide	0.516	19.9015	53.3993	ppm
		24.4855	53.3993	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 10:57:31
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



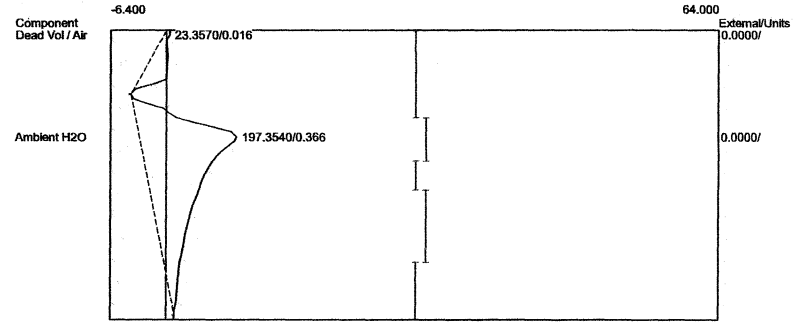
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	26.8750	0.0000	
Ambient H2O	0.383	187.9445	0.0000	
		214.8195	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 11:02:42
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



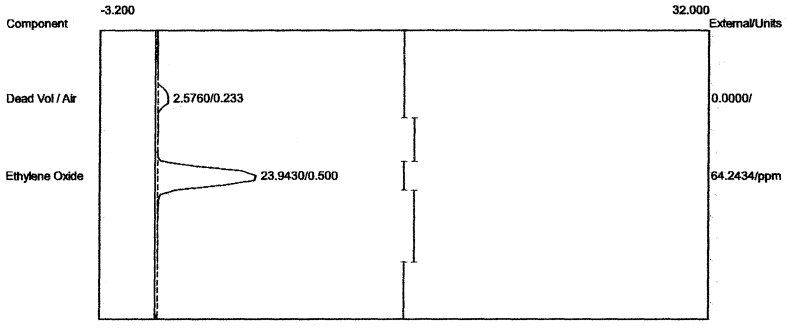
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.4755	0.0000	
Ambient H2O	0.333	0.1520	0.0000	
Ethylene Oxide	0.500	19.0470	51.1066	ppm
		21.6745	51.1066	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 11:02:42
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



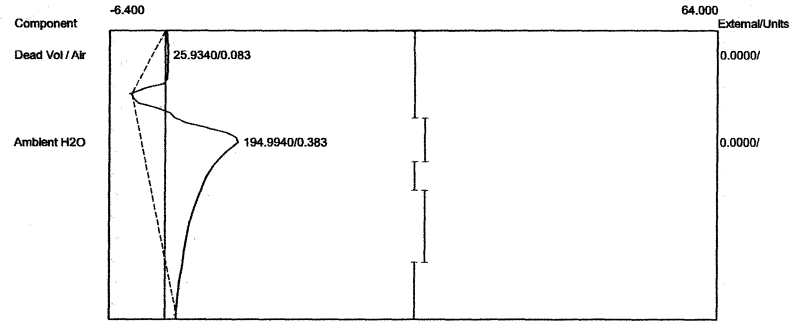
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	23.3570	0.0000	
Ambient H2O	0.366	197.3540	0.0000	
		220.7110	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 11:07:37
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



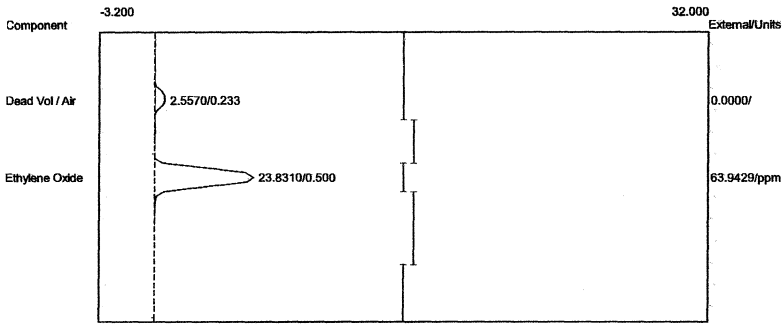
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5760	0.0000	
Ethylene Oxide	0.500	23.9430	64.2434	ppm
		26.5190	64.2434	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 11:07:37
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



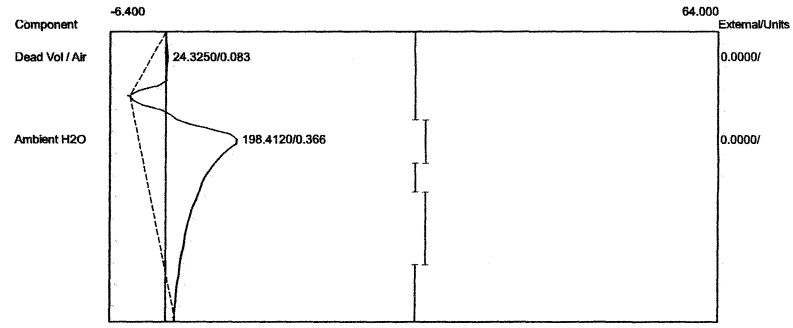
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.9340	0.0000	
Ambient H2O	0.383	194.9940	0.0000	
		220.9280	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 11:12:11
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



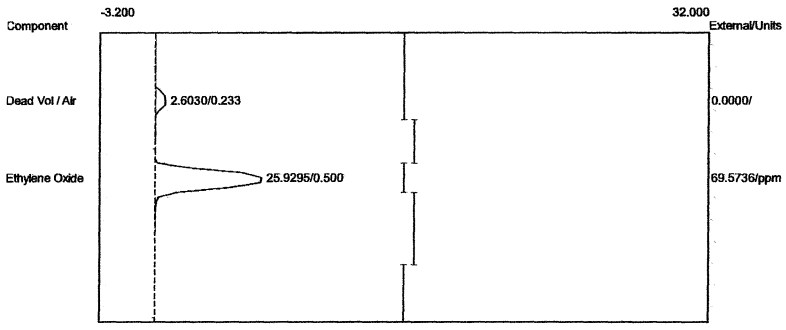
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5570	0.0000	
Ethylene Oxide	0.500	23.8310	63.9429	ppm
		26.3880	63.9429	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 11:12:11
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



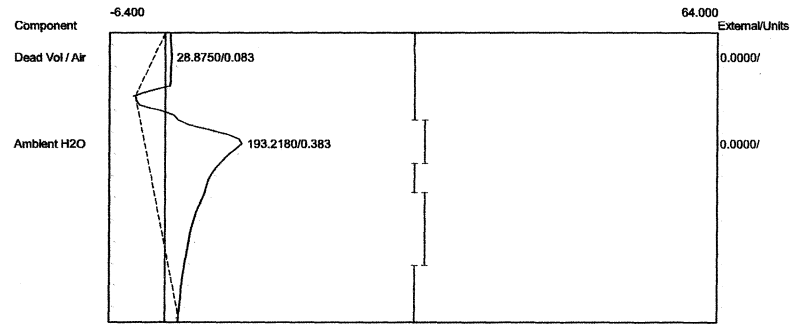
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	24.3250	0.0000	
Ambient H2O	0.366	198.4120	0.0000	
		222.7370	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 11:17:11
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



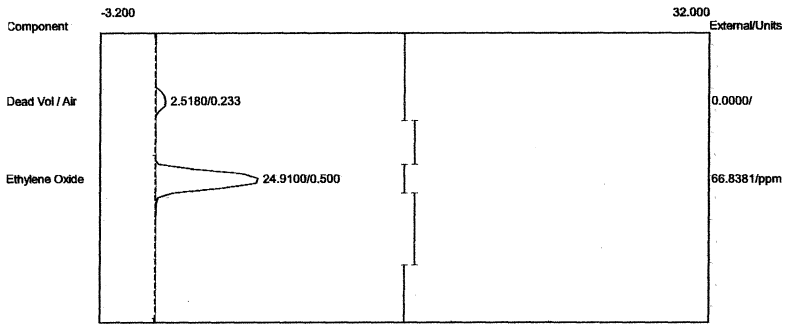
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6030	0.0000	
Ethylene Oxide	0.500	25.9295	69.5736	ppm
		28.5325	69.5736	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 11:17:11
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



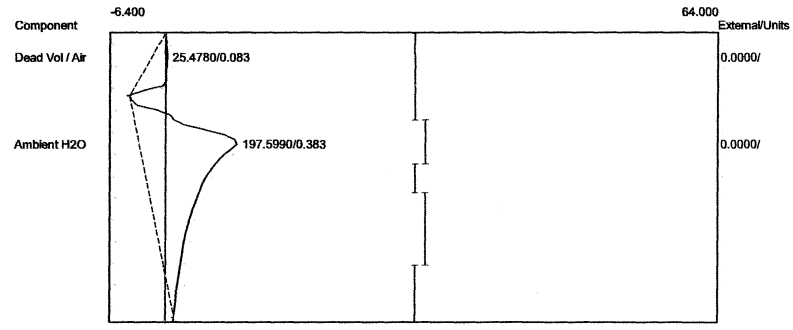
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	28.8750	0.0000	
Ambient H2O	0.383	193.2180	0.0000	
		222.0930	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 11:22:27
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-2A12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5180	0.0000	
Ethylene Oxide	0.500	24.9100	66.8381	ppm
		27.4280	66.8381	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 05/22/2018 11:22:27
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-2A12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer

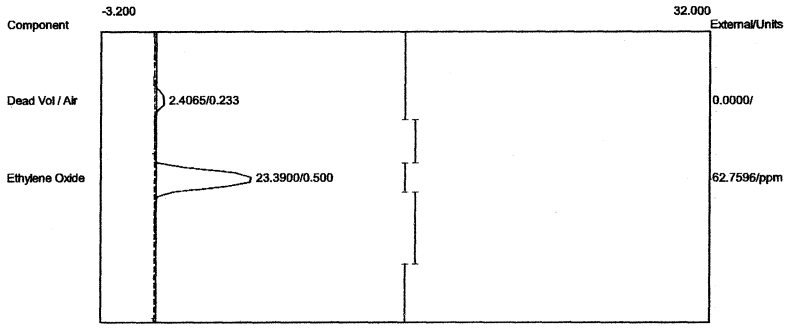


Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.4780	0.0000	
Ambient H2O	0.383	197.5990	0.0000	
		223.0770	0.0000	

APPENDIX F

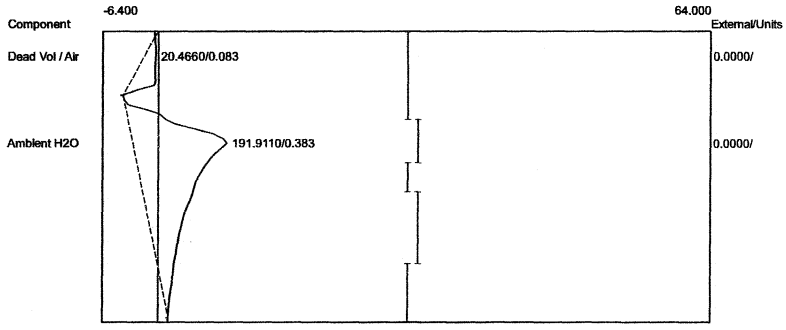
Run #3 Chromatograms - Backvent

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:07:10
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



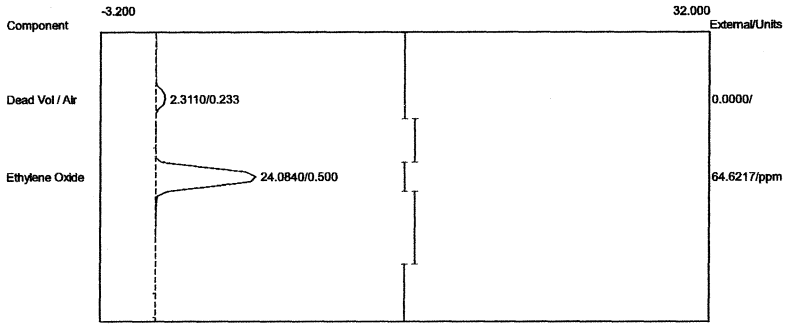
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.4065	0.0000	
Ethylene Oxide	0.500	23.3900	62.7596	ppm
		25.7965	62.7596	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:07:10
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



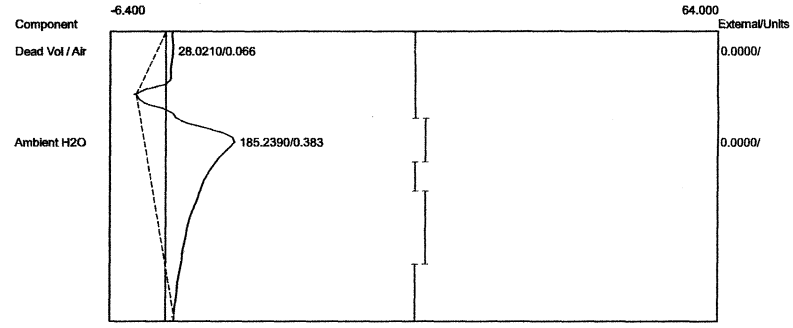
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	20.4660	0.0000	
Ambient H2O	0.383	191.9110	0.0000	
		212.3770	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:08:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



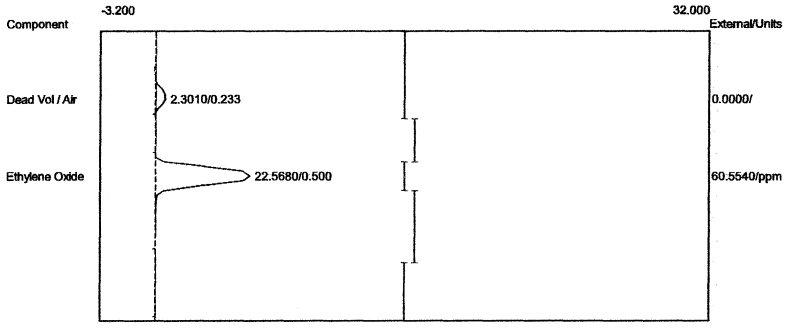
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.3110	0.0000	
Ethylene Oxide	0.500	24.0840	64.6217	ppm
		26.3950	64.6217	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:08:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



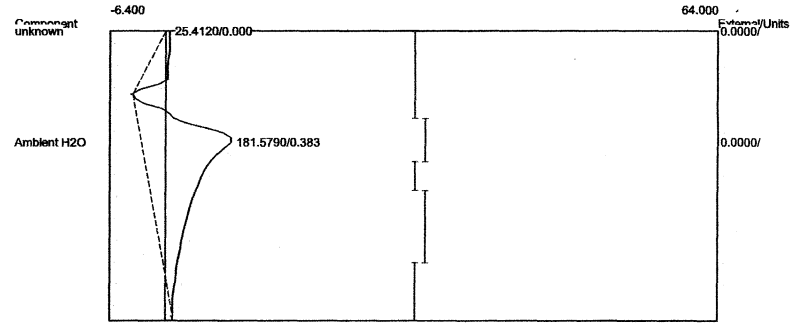
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	28.0210	0.0000	
Ambient H2O	0.383	185.2390	0.0000	
		213.2600	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:09:29
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



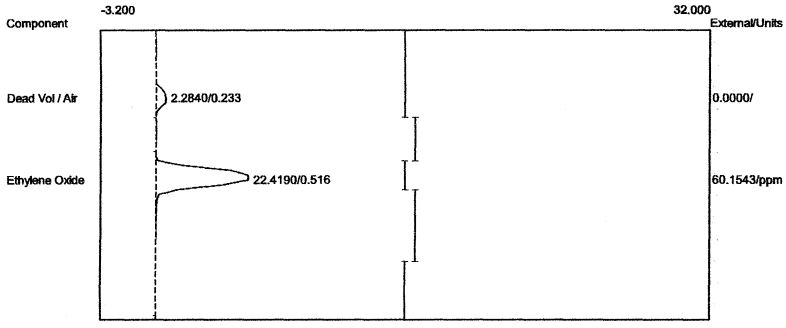
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.3010	0.0000	
Ethylene Oxide	0.500	22.5680	60.5540	ppm
		24.8690	60.5540	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:09:29
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



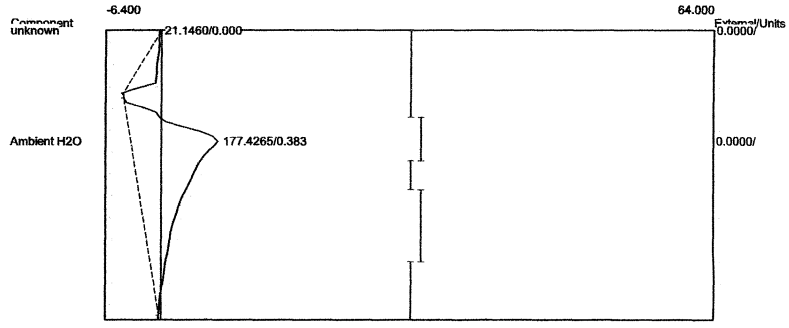
Component	Retention	Area	External	Units
Ambient H2O	0.383	181.5790	0.0000	
		181.5790	0.0000	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:10:33
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



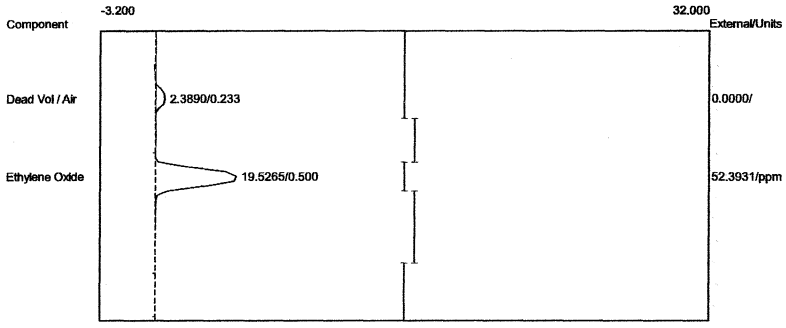
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.2840	0.0000	
Ethylene Oxide	0.516	22.4190	60.1543	ppm
		24.7030	60.1543	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:10:33
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



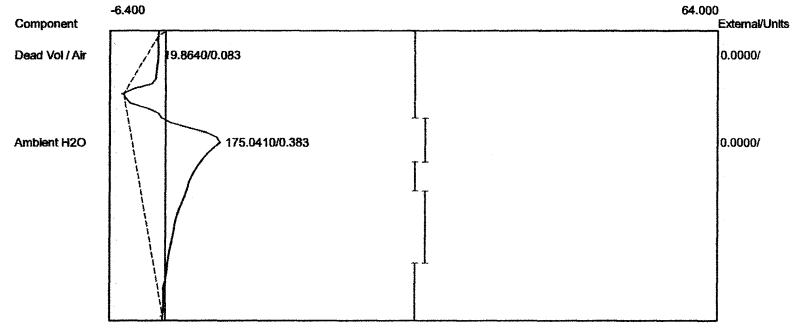
Component	Retention	Area	External	Units
Ambient H2O	0.383	177.4265	0.0000	
		177.4265	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:11:47
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



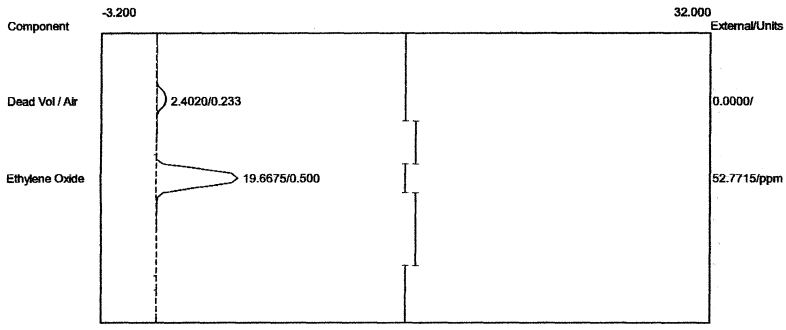
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.3890	0.0000	
Ethylene Oxide	0.500	19.5265	52.3931	ppm
		21.9155	52.3931	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:11:47
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



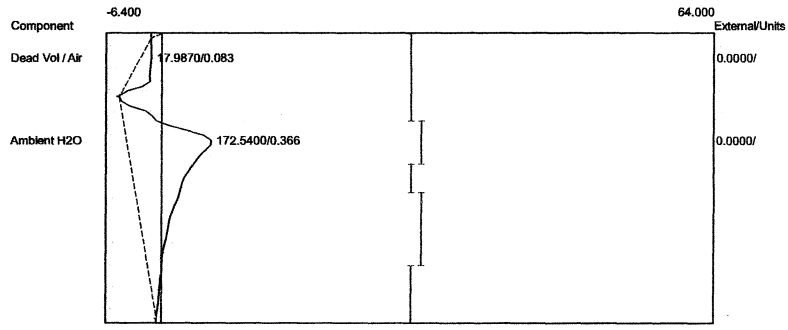
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	19.8640	0.0000	
Ambient H2O	0.383	175.0410	0.0000	
		194.9050	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:13:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



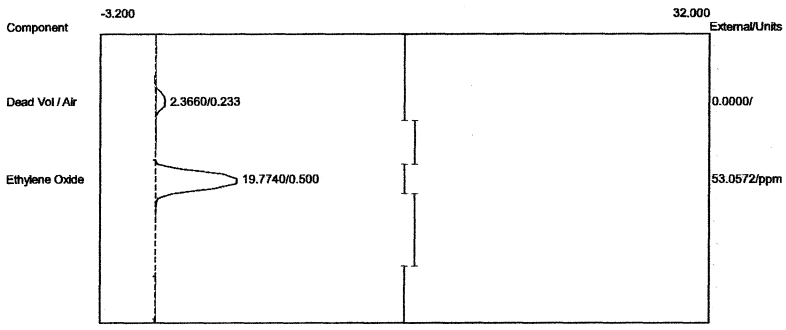
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.4020	0.0000	
Ethylene Oxide	0.500	19.6675	52.7715	ppm
		22.0695	52.7715	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:13:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



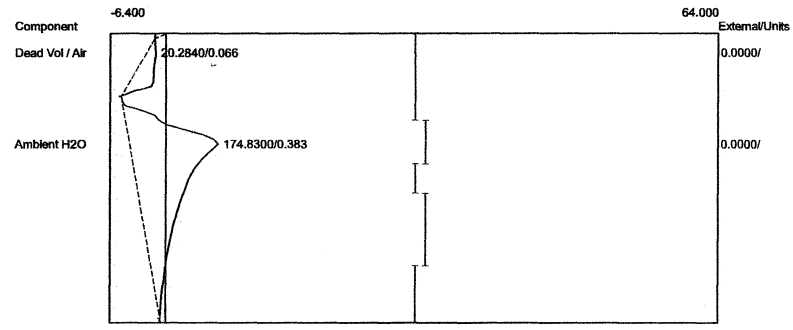
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	17.9870	0.0000	
Ambient H2O	0.366	172.5400	0.0000	
		190.5270	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:14:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



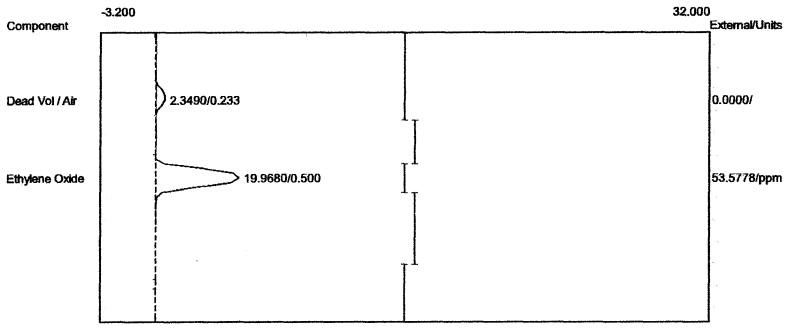
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.3660	0.0000	
Ethylene Oxide	0.500	19.7740	53.0572	ppm
		22.1400	53.0572	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:14:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



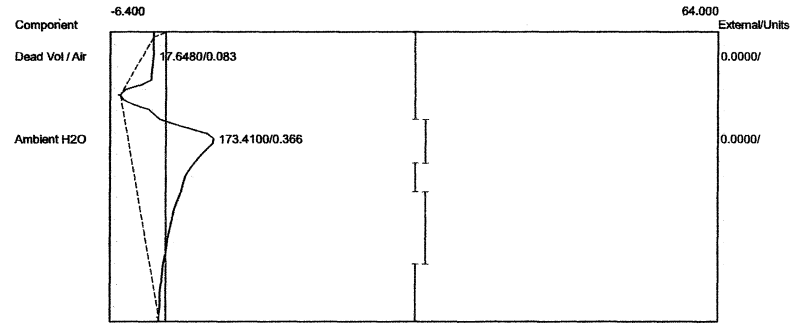
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	20.2840	0.0000	
Ambient H2O	0.383	174.8300	0.0000	
		195.1140	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:15:36
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



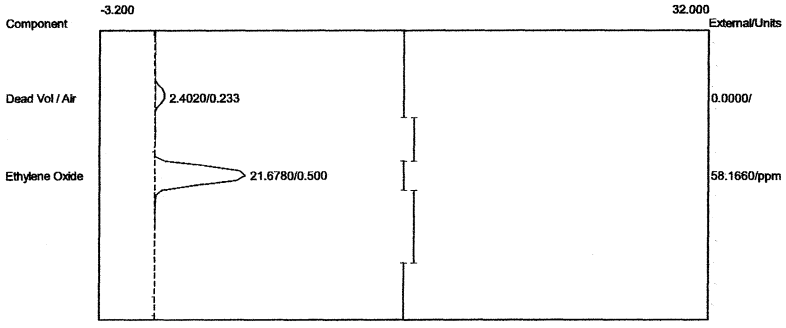
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.3490	0.0000	
Ethylene Oxide	0.500	19.9680	53.5778	ppm
		22.3170	53.5778	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:15:36
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



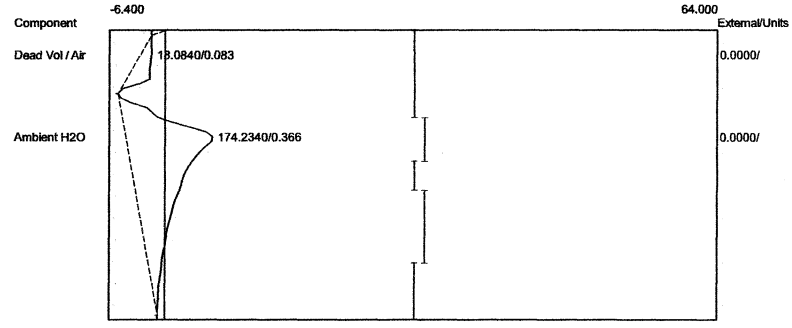
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	17.6480	0.0000	
Ambient H2O	0.366	173.4100	0.0000	
		191.0580	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:16:51
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



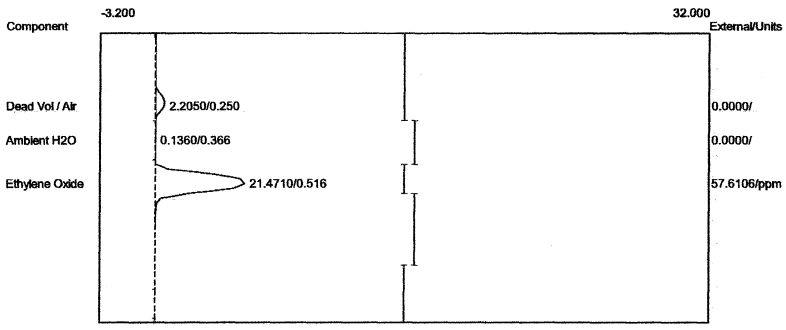
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.4020	0.0000	
Ethylene Oxide	0.500	21.6780	58.1660	ppm
		24.0800	58.1660	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:16:51
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



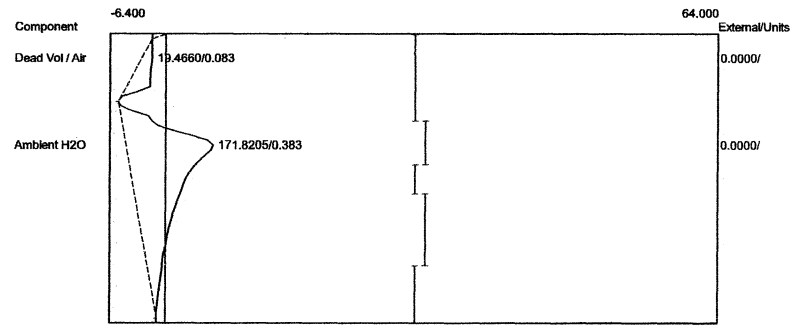
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	18.0840	0.0000	
Ambient H2O	0.366	174.2340	0.0000	
		192.3180	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:18:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



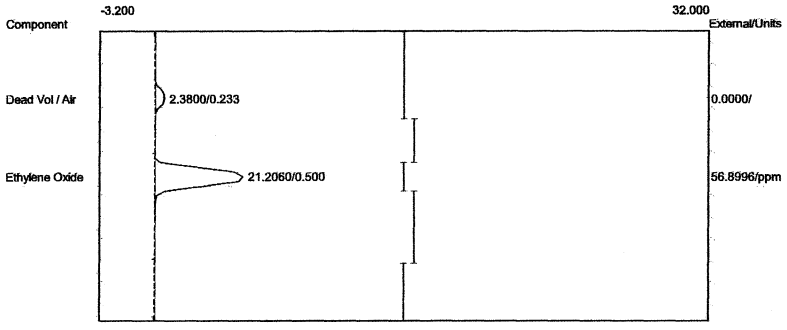
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	2.2050	0.0000	
Ambient H2O	0.366	0.1360	0.0000	
Ethylene Oxide	0.516	21.4710	57.6106	ppm
		23.8120	57.6106	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:18:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



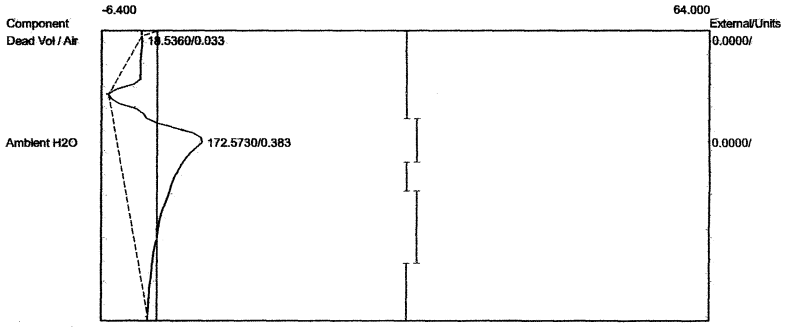
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	19.4660	0.0000	
Ambient H2O	0.383	171.8205	0.0000	
		191.2865	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:19:21
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



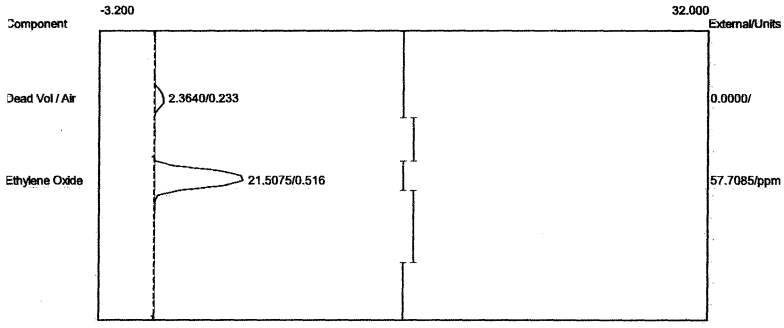
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.3800	0.0000	
Ethylene Oxide	0.500	21.2060	56.8996	ppm
		23.5860	56.8996	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:19:21
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



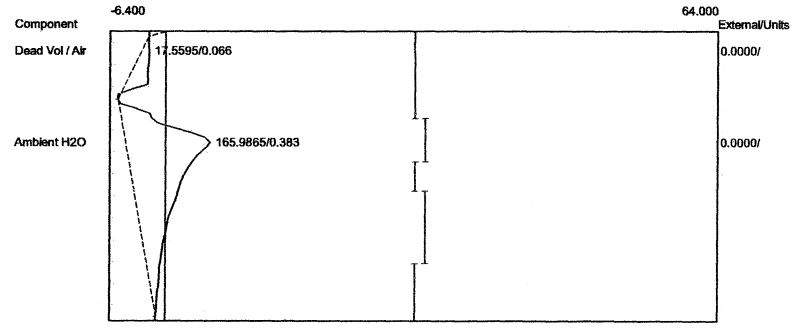
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	18.5360	0.0000	
Ambient H2O	0.383	172.5730	0.0000	
		191.1090	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:20:38
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3B12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.3640	0.0000	
Ethylene Oxide	0.516	21.5075	57.7085	ppm
		23.8715	57.7085	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 05/22/2018 14:20:38
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3B12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer

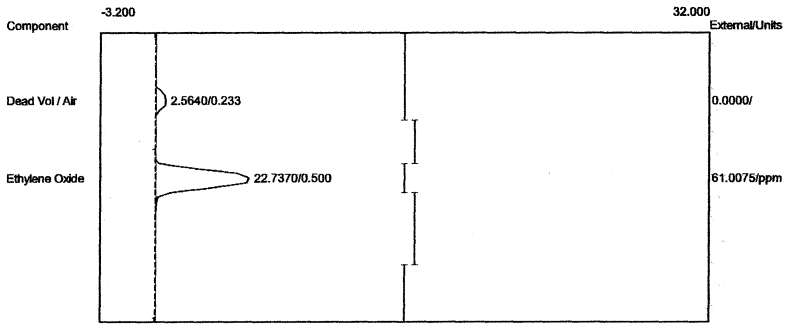


Component	Retention	Area	External	Units
Dead Vol / Air	0.066	17.5595	0.0000	
Ambient H2O	0.383	165.9865	0.0000	
		183.5460	0.0000	

APPENDIX G

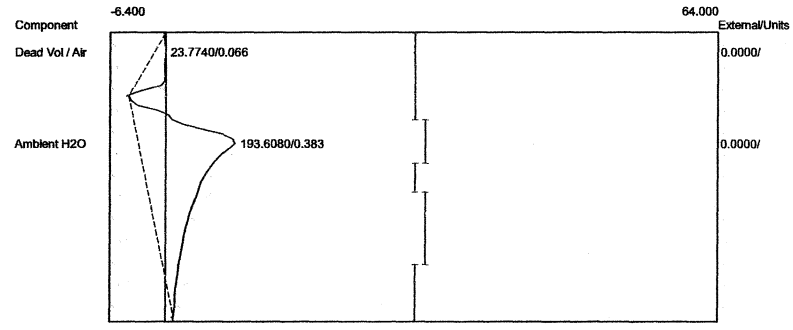
Run #3 Chromatograms - Aeration

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:27:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



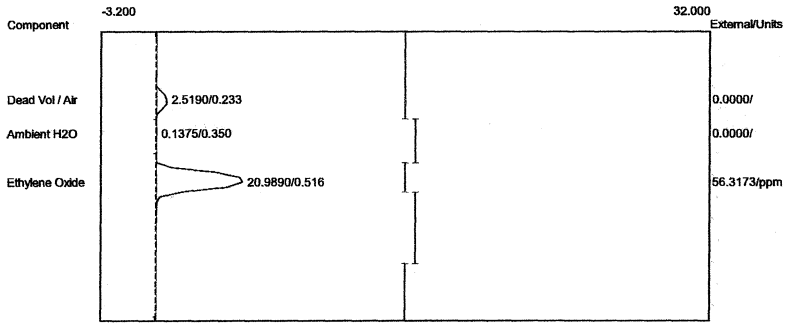
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5640	0.0000	
Ethylene Oxide	0.500	22.7370	61.0075	ppm
		25.3010	61.0075	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:27:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



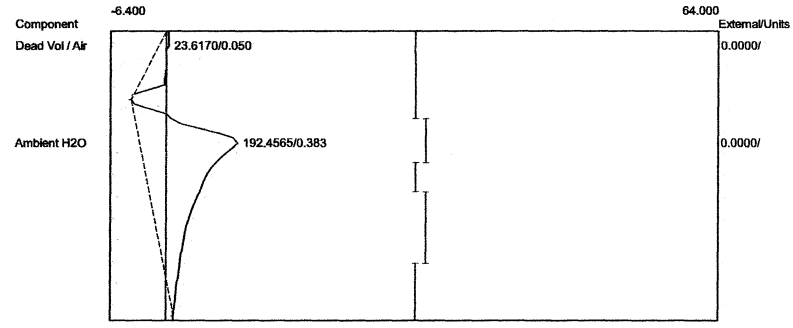
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	23.7740	0.0000	
Ambient H2O	0.383	193.6080	0.0000	
		217.3820	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:32:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



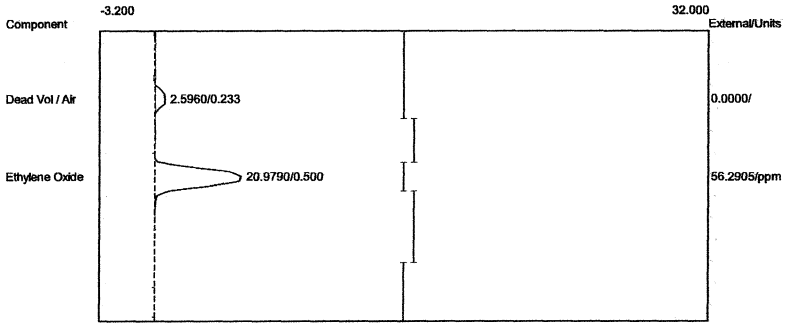
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5190	0.0000	
Ambient H2O	0.350	0.1375	0.0000	
Ethylene Oxide	0.516	20.9890	56.3173	ppm
		23.6455	56.3173	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:32:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



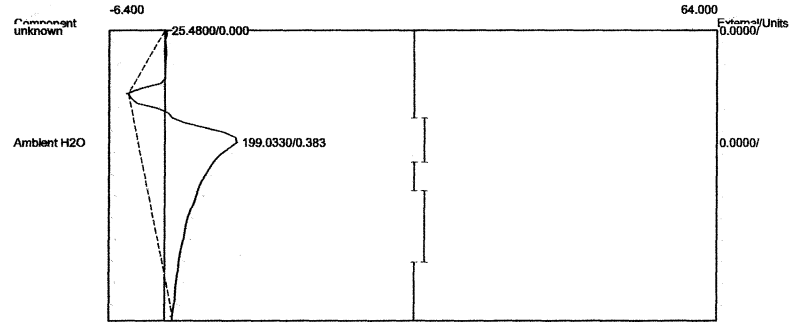
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	23.6170	0.0000	
Ambient H2O	0.383	192.4565	0.0000	
		216.0735	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:37:24
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



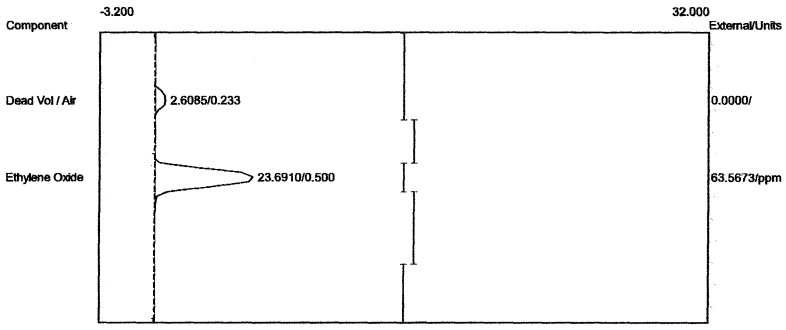
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5960	0.0000	
Ethylene Oxide	0.500	20.9790	56.2905	ppm
		23.5750	56.2905	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:37:24
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



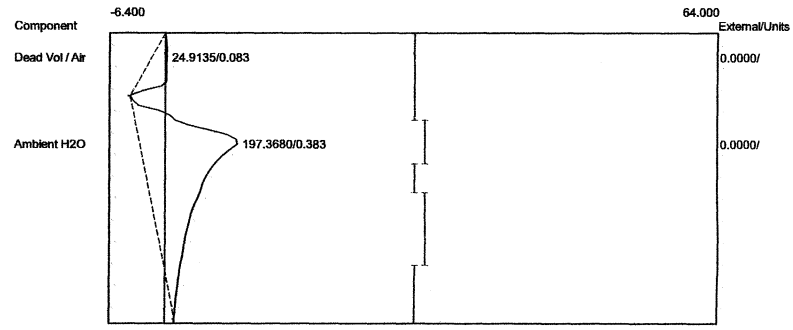
Component	Retention	Area	External	Units
Ambient H2O	0.383	199.0330	0.0000	
		199.0330	0.0000	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:42:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



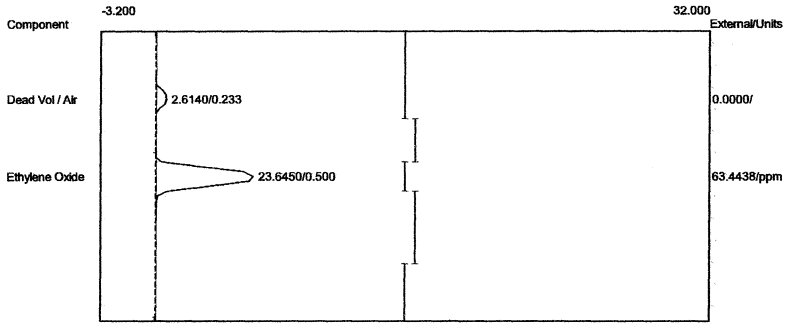
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6085	0.0000	
Ethylene Oxide	0.500	23.6910	63.5673	ppm
		26.2995	63.5673	

Lab name: EOSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:42:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



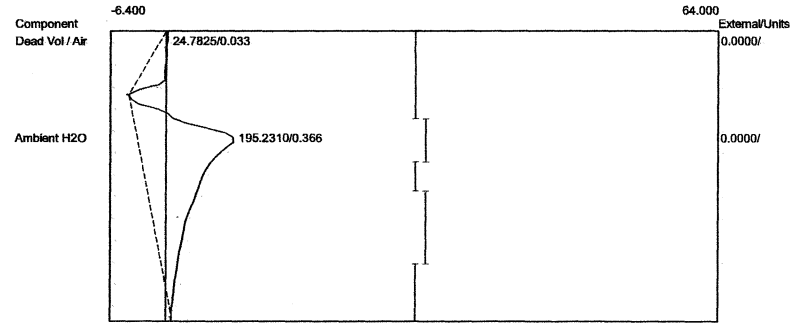
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	24.9135	0.0000	
Ambient H2O	0.383	197.3680	0.0000	
		222.2815	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:47:16
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



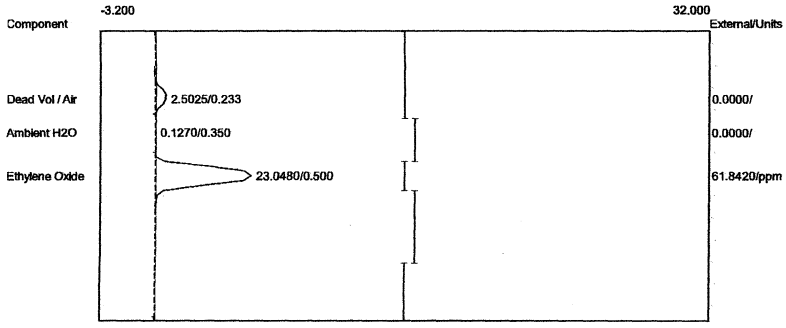
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6140	0.0000	
Ethylene Oxide	0.500	23.6450	63.4438	ppm
		26.2590	63.4438	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:47:16
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



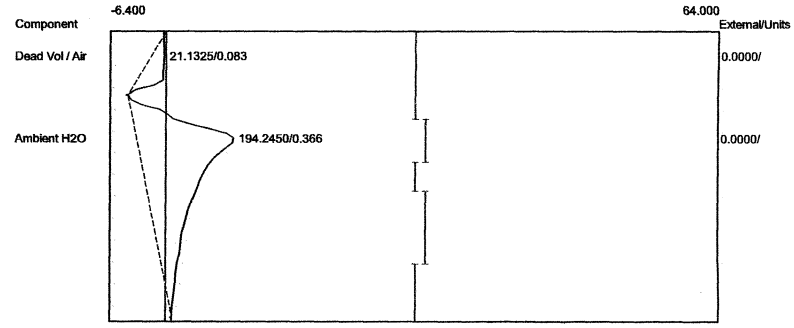
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	24.7825	0.0000	
Ambient H2O	0.366	195.2310	0.0000	
		220.0135	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:52:29
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



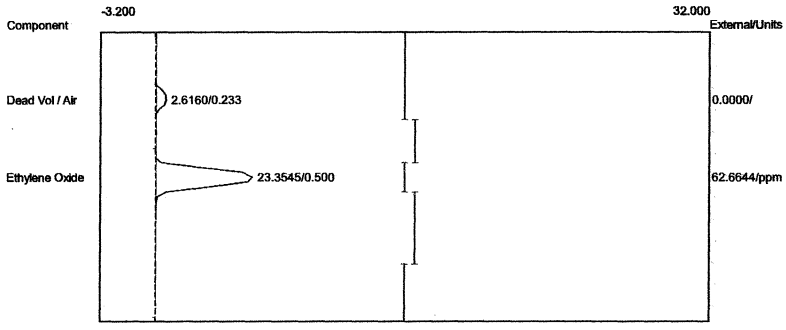
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5025	0.0000	
Ambient H2O	0.350	0.1270	0.0000	
Ethylene Oxide	0.500	23.0480	61.8420	ppm
		25.6775	61.8420	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:52:29
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



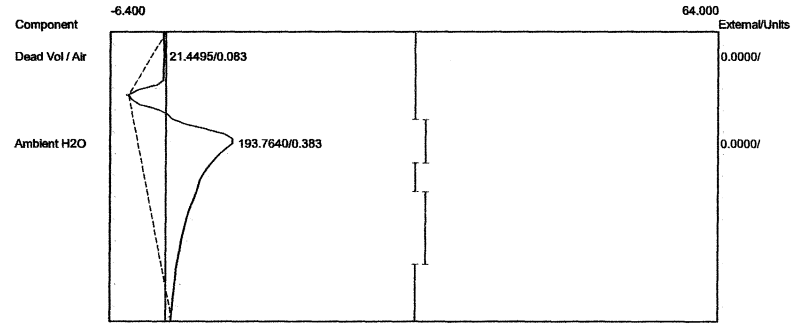
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	21.1325	0.0000	
Ambient H2O	0.366	194.2450	0.0000	
		215.3775	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:57:27
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



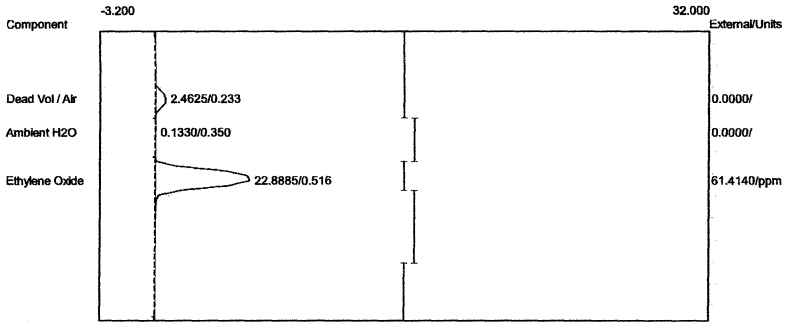
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6160	0.0000	
Ethylene Oxide	0.500	23.3545	62.6644	ppm
		25.9705	62.6644	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 11:57:27
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



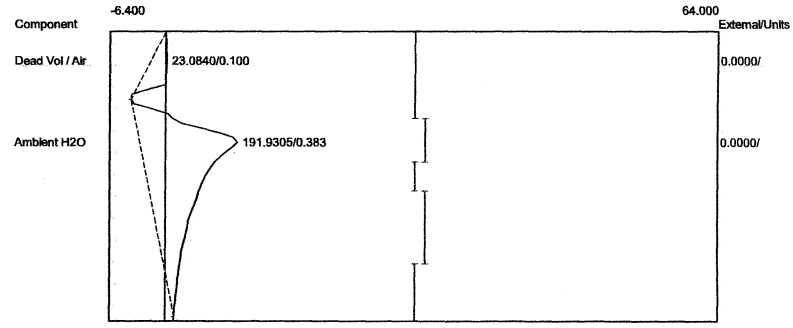
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	21.4495	0.0000	
Ambient H2O	0.383	193.7640	0.0000	
		215.2135	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 12:02:18
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



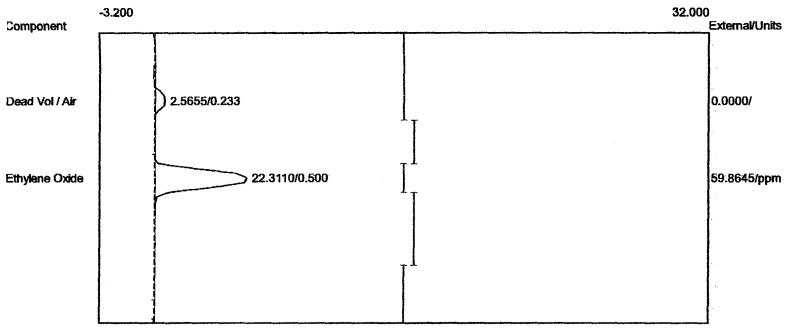
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.4625	0.0000	
Ambient H2O	0.350	0.1330	0.0000	
Ethylene Oxide	0.516	22.8885	61.4140	ppm
		25.4840	61.4140	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 12:02:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



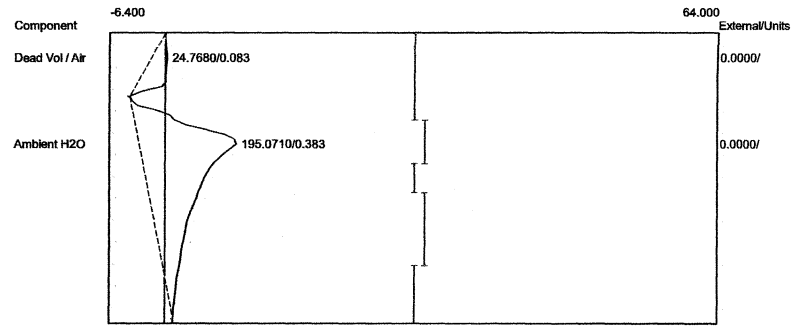
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	23.0840	0.0000	
Ambient H2O	0.383	191.9305	0.0000	
		215.0145	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 12:07:15
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



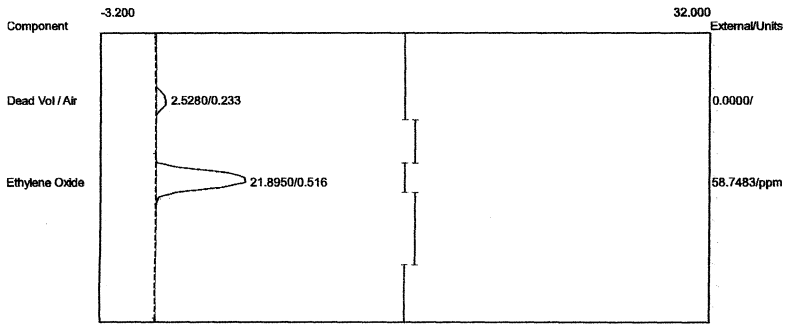
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5655	0.0000	
Ethylene Oxide	0.500	22.3110	59.8645	ppm
		24.8765	59.8645	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 12:07:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



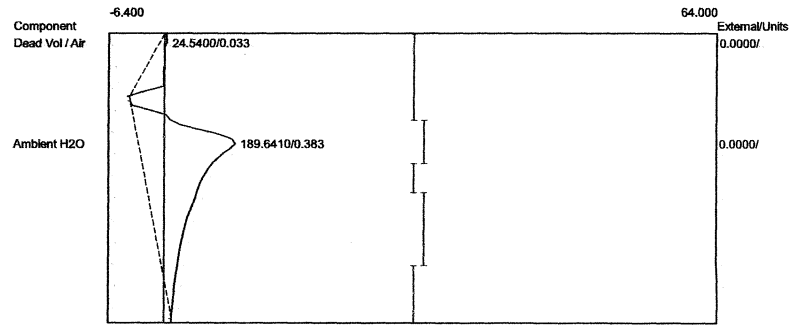
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	24.7680	0.0000	
Ambient H2O	0.383	195.0710	0.0000	
		219.8390	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 12:12:34
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



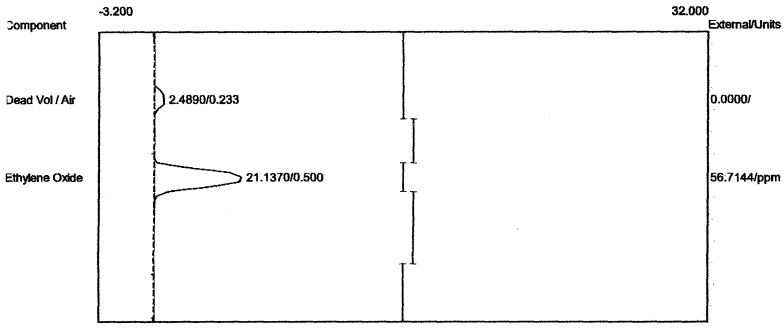
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5280	0.0000	
Ethylene Oxide	0.516	21.8950	58.7483	ppm
		24.4230	58.7483	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 12:12:34
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



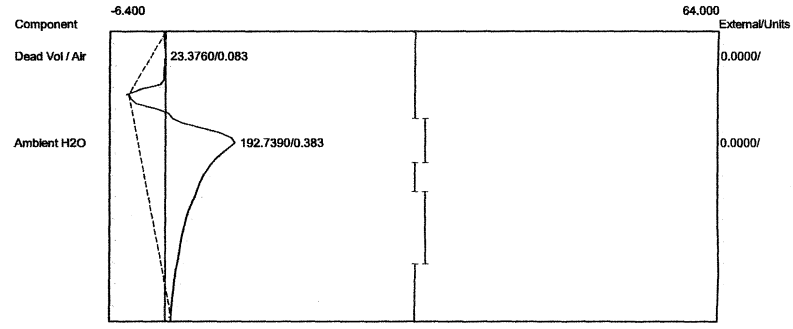
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	24.5400	0.0000	
Ambient H2O	0.383	189.6410	0.0000	
		214.1810	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 12:17:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



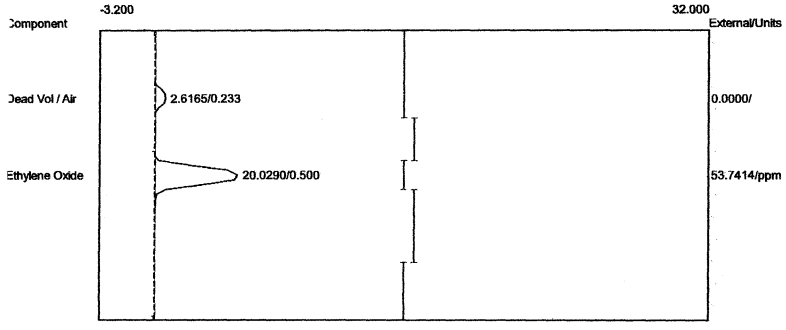
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.4890	0.0000	
Ethylene Oxide	0.500	21.1370	56.7144	ppm
		23.6260	56.7144	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 12:17:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



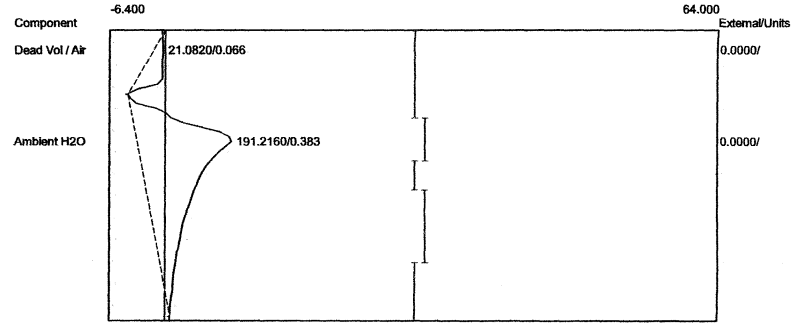
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	23.3760	0.0000	
Ambient H2O	0.383	192.7390	0.0000	
		216.1150	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 12:22:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2018-3A12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.6165	0.0000	
Ethylene Oxide	0.500	20.0290	53.7414	ppm
		22.6455	53.7414	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3Aer
Analysis date: 05/22/2018 12:22:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2018-3A12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.066	21.0820	0.0000	
Ambient H2O	0.383	191.2160	0.0000	
		212.2980	0.0000	

APPENDIX H

Field Data and Calculation Worksheets

ETHYLENE OXIDE SOURCE TEST/CALIBRATION DATA

Client: Sterigenics - Grand Prairie, TX

Source Tested: Maxon Catalytic Oxidizer - 15,000 cfm Date: 5/22/18

PRE CALIBRATION

	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO	1000 ppm EtO	10080 ppm EtO			
Inlet (FID)	Area Counts #1	.407	3.81	37.1					
	Area Counts #2/3	~~.409~~ .410	~~3.74~~ 3.78	~~37.3~~ 37.4					
	Average Area	.409	3.78	37.2					
	Audit Standard (48.8 ppmv) Result					49.8 ✓			
Outlet (PID)	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO					
	Area Counts #1	1.89	16.6	162					
	Area Counts #2/3	~~1.87~~ 1.90	~~17.1~~ 16.7	~~164~~ 164					
	Average Area	1.89	16.8	163					
	Audit Standard (48.8 ppmv) Result					48.6 ✓			

	Run #1	Run #2	Run #3		
~~Badvent~~ start/stop:	~~0849~~ 0904	~~0910~~ 0925	~~1406~~ 1421	P_{bar}:	—
Aeration ~~start~~/stop:	~~0925~~ 1025	~~1025~~ 1125	~~1125~~ 1225	%H_2O:	—

EtO Usage (lbs/yr): —

Cycles Per Week: —

POST CALIBRATION

	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO	1000 ppm EtO	10080 ppm EtO			
Inlet (FID)	Area Counts #1			✓					
	Area Counts #2								
	Average Area								
	Audit Standard (48.8 ppmv) Result					49.8 ✓			
Outlet (PID)	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO					
	Area Counts #1								
	Area Counts #2			✓					
	Average Area								
	Audit Standard (48.8 ppmv) Result					48.3 ✓			

ECSi

APPENDIX I

Gas Certifications

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases
600 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-001
Item No.: 02020001310TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CAL4448
Cylinder Size: CL
Certification Date: 20Apr2018

Customer

ECSI, INC
PO BOX 1498
SAN CLEMENTE, CA 92674

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1.10	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT DATE: 4-20-18

SPECIFICATIONS

Component Name	Requested Concentration (Moles)	Certified Concentration (Moles)	Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1. PPM	1.10 PPM	10.0	5.00
NITROGEN	BAL	BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1200 PSIG
Expiration Date: 20Apr2020

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

00 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-003
Item No.: 02020001320TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM003232
Cylinder Size: CL
Certification Date: 20Apr2018

Customer

ECSI, INC
PO BOX 1498
SAN CLEMENTE, CA 92674

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10.1	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT MT DATE: 4-20-18

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10.	PPM	10.1	PPM	1.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1200 PSIG
Expiration Date: 20Apr2020

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

2500 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-004
Item No.: 02020001330TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM011385
Cylinder Size: CL
Certification Date: 20Apr2018

Customer

ECSI, INC
PO BOX 1498
SAN CLEMENTE, CA 92674

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	100.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully BLM DATE: 4-20-18

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	100.	PPM	100.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1300 PSIG
Expiration Date: 20Apr2020

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

2300 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-005
Item No.: 0202000134OTCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM002810
Cylinder Size: CL
Certification Date: 20Apr2018

Customer

ECSI, INC
PO BOX 1498
SAN CLEMENTE, CA 92674

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1,000.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCall BLM DATE: 4-20-18

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1,000.	PPM	1,000.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1200 PSIG
Expiration Date: 20Apr2020

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

2600 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-006
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM005787
Cylinder Size: CL
Certification Date: 20Apr2018

Customer

ECSI, INC
PO BOX 1498
SAN CLEMENTE, CA 92674

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10,080.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully BLM DATE: 4-20-18

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10,000.	PPM	10,080.	PPM	.8	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 700 PSIG
Expiration Date: 20Apr2020

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFICATE OF ANALYSIS

Customer Name:	ECSi, Inc.	**Cylinder Number:**	SA25925
Stock or Analyzer Tag Number:	N/A	**Product Class:**	Certified Standard
Customer Reference:	Verbal- Dan	**Cylinder - Contents[1]:**	28 CF @ 2000 PSI
MESA Reference:	104448	**Cylinder-CGA:**	A006-HP-BR/350
Date of Certification:	4/19/2018	**Analysis Method:**	GC-TCD/FID
Recommended Shelf Life:	2 Years	**Preparation Method:**	Gravimetric

Component	Requested Concentration[2]	Reported Concentration[2,3]
Ethylene Oxide	50 ppm	48.8 ppm
Nitrogen	Balance	Balance

Authorized Signature:

1. The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.
2. Unless otherwise stated, concentrations are given in molar units.
3. Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/256175/96. Reference Certification #'s: 163/W, 830/N and 3280. Calibration methods are in conformance with MIL-STD 45662A.

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